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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Laboratory Furnishing and Research

THE ever-expanding development of chemical research, owing to the recognition of its necessity by industry, naturally involves a corresponding development of the laboratory in which it has to be conducted, together with all the apparatus and materials necessary for the work. In this issue some account is given of the gratifying progress that continues to be made in this country in the home production of laboratory glassware, apparatus, and chemicals. As in dyestuffs and fine chemicals, the old theory that one had to seek abroad for the necessary materials with which the research chemist conducts his operations has already gone. His needs can nearly all be supplied from the products of British work, and in point of quality these not only equal, but in some cases are said to surpass, the best to be obtained from other countries. Particularly gratifying is the advance, of which evidence is continually being produced, in the British production of chemicals for research and analysis, in laboratory equipment of every possible kind, in chemical glassware, and in all the general furnishings that go to the make-up of a modern laboratory. Last year, the development of modern chemical glassware in this country during the past decade was reviewed in our columns by Professor Turner, who drew a striking contrast between the poor position in which we stood when war broke out and the entirely changed situation at the end of ten years. In the last twelve months, in all the matters mentioned, progress has been well maintained, and the research worker never had so great a variety of choice among British productions as he has to-day.

Details which are available of the German exhibition which is to be held in Essen in June illustrate the enormous importance which German chemists and industrialists attach to the equipment of the research chemist, and even to slight improvements that may perceptibly add to the ease and accuracy of chemical operations and tests. There has been considerable enterprise shown in recent years on the part of the British producer in this field—enterprise which at the moment promised a very meagre reward, if any financial return at all. This aspect needs to be emphasised again and again, because the work is only half complete until the British user gives his full support to the British producer. Occasionally complaints have been heard that this support is not as cordial or as general as the production side has a right to expect, but with the steadily improving reputation of British products a change of attitude is gradually taking place, and the duty of the British user to the British manufacturer cannot be too often emphasised.

Progress in Scientific Instruments

IT is appropriate to the foregoing to note the publication this week of an important report on "Co-operative Industrial Research," which is issued by the Department of Scientific and Industrial Research, with a preface by the Earl of Balfour (H.M. Stationery Office, pp. 46, 9d.). In this the results of the scheme of industrial research by co-operative associations of manufacturers, begun as long ago as 1918, are carefully reviewed, with results that are everywhere encouraging and in some cases full of promise. Of particular interest is the account given of the work of the British Scientific Instrument Association. This Association has taken the wise view that its primary function is not to devise new instruments for special purposes, but to investigate the broad scientific principles underlying the design, production, and use of scientific instruments of all kinds. In this way an organisation has been created to which the industry can look for general scientific guidance, so that its efficiency may be improved and its output capacity increased. The absence of magnetic properties from the materials used in suspended galvanometer systems is an important condition for the accuracy and sensitiveness of the instruments. In the course of a detailed investigation extending over a considerable time, the Association found that certain of the materials commonly used possessed magnetic properties which, though extremely feeble, were of

considerable influence in such a sensitive system as that of the galvanometer. Methods of reducing or eliminating the magnetic effects were devised and are now being utilised by the industry, with a consequent improvement in the performance of the instruments manufactured. Towards the end of the war, again, a member of the Association developed the interferometer as an instrument for measuring the aberrations of lenses, the object being to facilitate the testing of optical elements such as prisms, lenses, and camera lenses so as to assist both the manufacturer and tester of lenses in determining quantitatively the aberrations of the system, or imperfections of workmanship or material, and thus to eliminate, practically entirely, the personal equation in estimating the degree of perfection attained by the design. The interferometer had not previously been used for these purposes in this country. As soon as it was demonstrated that the instrument did what optical instrument makers desired, the immediate result was its adoption, especially by makers of photographic lenses, and the receipt by the member's firm in question of orders to the amount of £3,000. A further result will, it is anticipated, be an all-round improvement in the efficiency of the optical industry of this country.

The Association has carried out a long investigation into the focusing of X-ray tubes and other problems connected with the behaviour and regulation of these tubes. Two firms at least have benefited by the results that were obtained. Much work has been devoted by the Association to the problems arising in the production and use of optical and coloured glasses, including neutral glasses. The method for determining the light absorption of optical glasses, developed by the Association, has been of service in comparing the transparency of British and foreign glasses, and it is thought that the method will find increasing use in the optical glass industry. It is not generally realised that glasses are liable, in the course of time, to undergo surface changes which greatly impair the performance of optical instruments in which they are incorporated. This question has been investigated very successfully, and the Association has devised methods whereby, firstly, the durability of a glass may be tested before use; and, secondly, the stability of lenses, prisms, etc., may be greatly improved by treatment prior to assembling the instruments. These results are said to be proving of considerable importance to the industry. The Association has also given attention to materials such as abrasives, polishing powders, solders, greases, waxes, and cements utilised in the manufacture of scientific and more especially of optical instruments; a number of specific products of this kind manufactured to the specifications and directions of the Association are in regular use in the works of members, and are effecting a diminution in the costs of production and also in some cases an improved quality of product. Many members have expressed their appreciation of the value of "Sira" abrasives in the grinding of glass surfaces. One firm of spectacle lens makers states that the "Sira" abrasive has enabled it to compete with foreign firms in the production of the better classes of lenses, of meniscus or toric form, the working cost of the spectacle lens with this abrasive having been reduced by 20 per cent. The firm has thus been able to start production and to give employment to workpeople locally, whereas it had previously bought and stocked lenses instead of making them on the premises.

Similar examples of progress are to be found in the various classes of research discussed. They are of interest to all interested in laboratory equipment and furnishing. Every advance makes converts among industrialists to faith in the essential value of research; as research extends laboratories and their staff multiply; and every such increase in laboratory enterprise is an encouragement and a reward to those who seek to equip the research chemist with the chemicals, instruments, and appliances that he needs for his vitally important work.

Metal or Sand Mouldings

PROFESSOR HINCHLEY'S paper on Monday, before the Chemical Engineering Group, on "Permanent moulding machines for cast iron" served a useful purpose in drawing the attention of British engineers and plant makers to an American practice which may have possible uses here. It cannot be said that his hearers at once jumped at the idea of replacing sand mouldings by the cast iron moulds described; the attitude was on the whole critical, Mr. Tungay at once mentioning the practical point that the method was chiefly applicable to the production of small castings required in large numbers; but, like most of the Group's discussions, it stimulated interest and set people thinking whether they had something to learn. The permanent mould, operated to some extent mechanically, has an obvious advantage in reduced cost where large numbers of the same casting are required, but the even more important consideration is the quality of the casting. Here Professor Hinchley set up a strong claim. Examination of the material after casting, he stated, showed that it was cast much better in permanent moulds than in sand moulds. Although the hardness was about the same, the tensile strength was increased from 20,000 to 27,000 lb. per square inch and the compressive strength from 52,000 to 71,000 lb. per square inch. The metal was close-grained, had a finer structure, and was free from blow-holes. In fact, the uniformity of the castings, their freedom from porosity, and their soundness, made possible the use of this material in some cases in place of brass. If all these claims are substantiated, the American process is certainly worth the evening spent in its discussion.

The method described by Professor Hinchley is known as the "Holley" process, and, as might be expected in an American device, it is designed for mass production at reduced cost. The "Holley" permanent moulds are of cast iron covered with a thin layer of refractory material which is faced at the time of casting with a heavy layer of carbon produced by the impingement thereon of an acetylene gas flame just before the time of pouring. The moulds, held together by toggle joints, are placed on a revolving table. In the course of the revolution of this table the moulds are opened, surface smoked, cores inserted, closed again, the molten metal poured, again opened and castings automatically forced out by ejection pins, and the mould surface submitted to a blast of compressed air for cleaning. Castings are produced of a perfectly formed fine grained structure, without any

sign of chilling, which are easily machined. As to the composition of the metal, a normal analysis showed it to include 3·5 per cent. carbon, 2·55 per cent. silicon, 0·285 per cent. phosphorus, 0·085 per cent. sulphur, and 0·065 per cent. manganese.

Dr. Crossley's Successor

THE governors of the Shirley Cotton Research Institute may be congratulated on having found so competent a successor to the late Dr. Crossley as Dr. R. H. Pickard, who is the head of the Battersea Polytechnic, has had the advantage of previous association with Lancashire, and is well known as an eminent chemist and administrator. He begins with two initial points in his favour—his appreciation of the great ability with which Dr. Crossley brought textile research to its present condition, and his grasp of the real purpose and meaning of research.

At the dinner in Manchester which Mr. Kenneth Lee gave in his honour the other night, Dr. Pickard pointed out one mistake or premature assumption in the founding of the various research associations that have latterly come into existence. It was assumed, he said, that one only had to get together a sufficient number of scientific people and give them five years and they would convince the industries that research paid. He thought not only five, but even ten years too short. He might have added that any period is too short if the purpose is merely to make research pay. Incidentally, it does pay almost invariably in the long run, but it pays best, not when it is directed specifically to financial results, but when it fulfils its proper function of discovering new knowledge. It is for the commercial mind to see in this new knowledge possible improvements of existing methods or sometimes entirely new methods of production that may revolutionise industry. Successful as this country has been in most industries, many of them are very old, employing still in some cases methods nearly as old as themselves, and have been built up by the process of trial and error. That is a very sound process so far as it goes, but it is incomplete without adequate scientific knowledge. As a guarantee against decline or stagnation, and as a possibility of discovering new lines of advance, the textile industry has a sound faith in fundamental research, and it has promptly made it clear that to Dr. Pickard, as to the late Dr. Crossley, it will give loyal support.

The Edinburgh Annual Meeting

THE arrangements for the annual meeting of the Society of Chemical Industry, to be held in Edinburgh during the week July 4 to July 8, indicate a gathering quite up to the usual level of interest. The city itself is one of our finest capitals, and the social gatherings, the civic and university receptions, the excursions to places of historical interest, and the inspections of works would almost justify the visit in themselves. Mr. Francis H. Carr, who, we are glad to note, has been nominated to serve as president for another year, will deliver his presidential address on the Tuesday morning after the annual meeting. At the latter there will be the interesting ceremony of the presentation of the Society's medal to Colonel G. P. Pollitt, of Synthetic Ammonia and Nitrates, Ltd., and one of the most important addresses later in the week promises to be Colonel Pollitt's review of the development of the synthetic ammonia and nitrate industry in Great Britain. The full list of subjects for discussion has not yet been issued, but the subjects already selected include the physiological and industrial aspects of the chemistry of carbohydrates; coal cleaning; and paper. In addition to the re-nomination of Mr. Carr, Mr. E. V. Evans, Mr. C. S. Garland, Dr. Levinstein, and Sir Alfred Mond have been nominated as vice-presidents, Dr. E. W. Smith has been elected hon. treasurer and Dr. E. F. Armstrong hon. foreign secretary. The financial aspect of the society's work, which of late years has caused some slight concern, is, we believe, improving, and the treasurer may contemplate the annual ordeal of presenting the accounts with comparative composure.

Books Received

WELLCOME HISTORICAL MEDICAL MUSEUM. Lister Centenary Exhibition Handbook. London: The Wellcome Foundation, Ltd.

CAPITAL FOR LABOUR. By Francis Lloyd and Bertram Austin. London: T. Fisher Unwin, Ltd. (Ernest Benn, Ltd.) Pp. 142. 3s. 6d.

THE CHEMISTS' YEAR BOOK, 1927. Edited by Dr. F. W. Atack. Manchester: Sherratt and Hughes. Pp. 1180. 21s.

PROCEEDINGS OF THE CHEMICAL ENGINEERING GROUP. Vols. VIb and VII. 1924–1925. London: Chemical Engineering Group. Pp. 200. 10s. 6d.

The Calendar

May		
4	Society of Chemical Industry (Yorkshire Section): Annual General Meeting.	Leeds.
2	Institution of the Rubber Industry: "Specifications for Rubber Goods and the Value of Performance Tests." John M. Bierer. 8 p.m.	Engineers' Club, Coventry Street, Piccadilly, London.
2	Society of Chemical Industry (London Section): "Recent Investigations on Contact Insecticides." F. Tattersfield and C. T. Gimingham. 8 p.m.	Burlington House, Piccadilly, London.
4	Society of Public Analysts. 8 p.m.	Burlington House, Piccadilly, London.
5	Chemical Society. 8 p.m.	Burlington House, Piccadilly, London.
6	Chemical Engineering Group: "Chemical Fire Extinguishers." Dr. W. R. Ormandy. 8 p.m.	Imperial College of Science and Technology, Kensington, London.
9	Royal Society of Arts (Cantor Lecture): "The Measurement of Light" Lecture III). John W. T. Walsh. 8 p.m.	John Street, Adelphi, London, W.C.2.
10	Institution of Petroleum Technologists: General Meeting. 5.30 p.m.	House of the Royal Society of Arts, Adelphi, London.
10	King Edward's Hospital Fund for London: "Are Capitalists Overpaid?" Sir Ernest Benn and James Maxton, M.P. 5.30 p.m.	London School of Economics, Aldwych, London.
11	Institute of Metals: "The Growth of Crystals in Supersaturated Liquids." Sir Henry A. Miers. 8 p.m.	Institution of Mechanical Engineers, Storey's Gate, Westminster, London.
12	Oil and Colour Chemists' Association: Annual General Meeting. "Some Physical Factors Influencing Properties of Paint Pigments." A. de Waele. 8 p.m.	8, St. Martin's Place, Trafalgar Square, London.
12	British Science Guild: Annual Dinner. Speakers: Sir Alfred Mond, Sir William Pope, etc.	Criterion Restaurant, London.
12	Optical Society. 7.30 p.m.	Imperial College of Science and Technology, London.

Modern Laboratory Equipment and Furniture

Notes on the Present Position and Available Products

In order that the laboratory worker may carry out his many and varied tasks with the maximum of efficiency it is essential that laboratories should, as far as possible, be equipped in the most complete manner, and that an eye should be kept on any new equipment which appears on the market. Below are given some notes dealing with laboratory fitments and chemicals, every kind of which can now be obtained from British manufacturers and dealers.

Laboratory Ware and Chemicals

Recent Progress in Great Britain

INQUIRIES into the present state of the laboratory furnishing industry in this country reveal a general sense of satisfaction at the progress made in recent years. The standard of British laboratory furnishing, one authority on the subject informs us, has been raised considerably since the end of the war, it now being possible to obtain practically any apparatus or materials of British manufacture which are of sufficiently high quality to satisfy the most exacting requirements. Manufacturers have both extended the range and improved the quality of their products, an advance to which the war contributed much by showing the deficiencies of home products. Apart from the fact that many more products are now marketed, the reports of scientific workers would seem to indicate that they reach a sufficiently satisfactory standard to replace those products which were formerly imported, although extremely fastidious workers in some cases prefer foreign chemicals.

The inorganic chemicals have always been good, although formerly limited in range, so that the improvement in this direction is an increase chiefly of numbers, while organic chemicals show an advance both in number and quality. A survey of makers' catalogues reveals the addition to the range of British materials of about 2,000 new reagents, fine chemicals for analytical, research, technical, and educational purposes.

Laboratory apparatus also shows a marked improvement. The range of glassware has been widely extended and quality is equal to that of the best German ware, and porcelain has reached a higher standard, although opinions differ as to the heat-resisting qualities of various British articles. Microscopes and optical instruments are in a strong position in spite of the depression in the optical glass trade, and many makers, owing to the high quality of the instruments they now produce, are receiving orders, not only in this country but from Continental customers who formerly went to Germany; in some cases orders from Germany have been received. Filter papers are proving satisfactory, as also is heat-resisting glassware.

Not only has the standard of British-made laboratory equipment been raised, but there are an increasing number of workers using the materials and apparatus marketed, and it is definitely known that over 300 colleges, schools, and institutes are making every endeavour to use British laboratory equipment where it is possible to do so.

British Materials at the Imperial College

We are indebted to a high authority on the staff of the Imperial College of Science, South Kensington, for the following notes on the use of British laboratory materials in that institution:

"The Organic Chemistry Department of the Imperial College trains, on the average, 55 students every year; in addition, it provides facilities for over 30 research students, most of whom work for the London Ph.D. or D.Sc. degrees. The provision of apparatus, glass, and materials for this number of students is no small problem, and inquiry shows that practically all supplies are obtained from British sources.

"1. *Glass.*—British resistance glass, although more expensive than Jena glass, is undoubtedly superior to the latter, and the use of it minimises the number of breakages; for research purposes, the British-made 'Pyrex' glassware is used almost exclusively. British combustion and Carius tubing is stocked in addition to ordinary soft glass tubing, rod and capillary tubing. Foreign (Czechoslovakian) test-tubes are used to some extent on account of their cheapness, as also a limited amount of blown-glass apparatus (separating funnels, etc.).

"2. *Apparatus.*—All ordinary laboratory equipment, electrical apparatus, etc., is of British origin; there is a British-made ozoniser which is frequently used.

"3. *Instruments of Precision.*—Whilst a number of balances and optical instruments which were purchased before the war are of foreign origin, those which are being procured now are British-made. Cheap German thermometers are still used, but for accurate work excellent British-made thermometers are available.

"4. *Chemicals.*—The vast majority of the chemicals used in the department is produced in Great Britain. A notable exception is pure methyl alcohol, which is still obtained from Germany, as the German product is much cheaper and of a high degree of purity. A few research materials are obtained from France, particularly certain ketones and esters, prepared by catalytic processes and not procurable in this country, but British firms, notably Boake, Roberts and Co., of Stratford, and Boots, of Nottingham, to mention but two, not only supply the demand for the more ordinary starting materials for research but frequently undertake the preparation of special materials not usually marketed. This readiness to meet new demands is a particularly welcome sign, showing that manufacturers are abandoning the short-sighted policy of catering only for established markets."

British Scientific Instruments

Professor Donnan on Recent Progress

"There are certain British firms, particularly optical and electrical instrument specialists, whose instruments are pre-eminent and are in demand throughout the world," stated Professor F. G. Donnan, F.R.S., Professor of General Chemistry at University College, London, in an interview with a representative of THE CHEMICAL AGE, "and on the whole general laboratory apparatus is now supplied to laboratories in this country almost exclusively by British makers."

Many high class instruments, he stated, were now obtainable from British firms for which before the war it would have been necessary to go abroad. Given adequate support, British makers should in time be able to hold their own, but at present they were handicapped by having only a limited market and were unable to produce as cheaply as might otherwise be possible.

While he considered that industrial apparatus and materials should be subject to duty, he confessed that he would like to see purely scientific apparatus free of duty, for on occasion there was apparatus which it was desirable to buy from abroad, but which was not easily obtainable owing to Customs delay and to high cost resulting from high duty.

With regard to chemicals, glassware and general apparatus, British products were quite as good as, and, in some cases, better than the foreign equivalents, although there were some organic chemicals not manufactured in this country which had to be obtained from America.

To sum up, great advances, Professor Donnan said, had been made in British laboratory equipment. General laboratory apparatus and chemicals were quite satisfactory, and many British instruments were unapproachable for quality. The makers, as a whole, were passing through a transitory period and were handicapped by the lack of a world market, and, although it might be desirable in some cases, the freeing of foreign apparatus from import duty would probably be prejudicial to the quality and price of the home product.

Research and Industry

Their Mutual Interdependence and Benefit

In the past few years there has been, the world over, a notable increase in the number of men and women engaged in pure scientific research. Especially in America, an enormous amount of money has been spent. In these circumstances, it is very gratifying that the prestige of British science still stands very high, and that the work turned out here is of a quality which will bear comparison with the best that is done elsewhere. Moreover, immense progress has been made in effecting co-operation between science and industry. Especially

valuable in this connection has been the work of the Department of Scientific and Industrial Research. Already it is clear that industry has gained immensely from this movement, and the gain is bound to grow rapidly as the effects of research —necessarily slow in their action—gain momentum.

It should not, however, be forgotten that just as industry can benefit greatly by contact with pure science, the pure scientist finds it to his advantage to work in a country possessing well-organised industry. Especially is this so in the case of the chemist. In times past (especially in the pre-war period) the production of his materials has often been the bugbear of the research worker. Often it was the case that before he could work on the production and investigation of new substances it was necessary to spend a great deal of time in preparing his initial materials. Another real difficulty occurred in the need of pure chemicals for analytical purposes. As regards these matters, the situation has completely changed. Many important research products are now made by chemical manufacturers as a matter of routine. In addition, many of them have shown great readiness to carry out especially difficult preparations or to carry out certain stages in the manipulations. Prominent in this regard has been the work of the British Drug Houses, Ltd., who some five or six years ago created a special department for the preparation of research chemicals. Despite the fact that this part of their business is largely altruistic, they have continued to add steadily to the number of research chemicals available, thus assisting in a large measure to keep workers in this country independent of foreign supplies. It is difficult for anybody who has not had actual experience of research to realise the immense saving in the time and labour of the research worker which is thus effected. That the gain is appreciated is shown by the frequency with which acknowledgments are made, in papers read before various scientific bodies, to the assistance thus afforded. Furthermore, the British Drug Houses have helped to solve the problem of pure chemicals for analysis, indicators, etc., of which they supply an enormous range.

In yet another direction this company has been carrying out very valuable work. New results achieved in biochemistry and therapeutical chemistry must be made available to the general public as soon as possible for the alleviation of unnecessary suffering and the cure of disease. The British Drug Houses have achieved a number of notable successes in this direction. The manner in which the production and supply of insulin was rapidly put on a sound basis is too well known to need discussion here. In the case of thyroxine also the company showed how soon the results of the research worker could be translated into commercial terms. It will be remembered that this substance was synthesised by Harington and Barger, the synthesis being announced at the beginning of the year. Within a few weeks, at the British Industries Fair, the British Drug Houses showed samples of thyroxine and of all the intermediate products necessary for its synthetic production. The name of the company has been mentioned in connection with the work of Dr. O. Rosenheim on the sterols, Dr. H. W. Dudley on spermine, and other work.

Acid-Resisting Waterproof Flooring

A good deal of interest is being taken in the use of Prodorite for acid-resisting flooring. Prodorite is a new form of concrete in which the Portland cement is replaced by specially prepared patent pitch. It is fundamentally different from all previously prepared compositions of mineral matter with bituminous or asphaltic material. The material is fully patented and is sold under the trade mark Prodorite by Prodorite, Ltd., whose London office is at Cecil Chambers, Strand (head office and works at Eagle Works, Leabrook, Wednesbury, Staffordshire). Prodorite is claimed to be resistant to practically all acids, even to hydrochloric acid of any strength hot or cold. This alone deserves attention and closer investigation of this product. Strength is always sought after, and here again Prodorite offers an advantage, since recent official tests on standard material gave crushing strengths of over 6,000 lb. per square inch.

Prodorite flooring is laid on any ordinary foundation such as concrete about 2 in. thick. The floor is composed of pre-cast slabs 18 in. square properly bedded or grouted and jointed with special Prodorite jointing having the same resistance to acids as the pre-cast slabs. The finished floor presents a solid aspect with good wearing qualities and non-slip surface. The material does not flow under weight, is non-corrodible, non-porous, and non-conducting. The makers are prepared to quote for any job, but prefer to consider each separately, in order to get the best results in an economical manner. They point out that it is suitable, not only in laboratories, but anywhere where an acid resisting floor giving strength is required, for example, in chemical works, tinplate works, dipping sheds, accumulator rooms, brewery cellars, etc., sewerage schemes, galvanising works, artificial silk works, and in many other places. In inquiries, the manufacturers ask that full details shall be supplied including :—(1) The maximum temperature to which the Prodorite will be subjected (the standard product is made to withstand 65° C.) ; (2) The maximum load per square foot ; (3) The nature and concentration of any chemicals, including gases, that will come in contact with the material.

Electrically Heated Laboratory Apparatus

In addition to manufacturing and designing their well-known electric laboratory furnaces, A. Gallenkamp and Co., Ltd., of 19-21, Sun Street, Finsbury Square, London, have also a wide experience in the electric heating of general laboratory apparatus, such as baths, drying ovens, stills, etc., and further are prepared to apply electrical heating to any form of laboratory appliance which lends itself to the electric method.

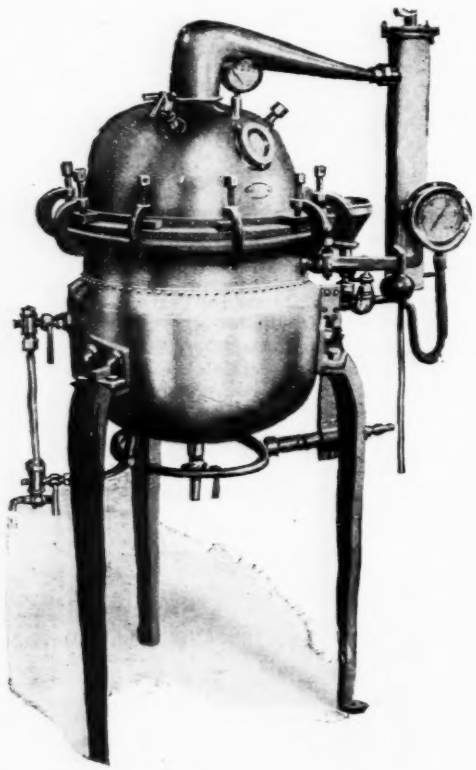
Below is illustrated an electrically-controlled water bath, the design of which shows the neatness and compactness of the heating elements ; their design also facilitates ease of inspection and replacement of heating elements, this being a very important point, to which special attention has been given in all such apparatus made by this company ; renewal elements can be fitted in a few minutes. Gallenkamp electrically-heated apparatus embodies the latest and best elements, and the method of application is on the lines of the most approved modern electric heating practice. Water heating apparatus is fitted with heavy-gauge brass heat bottoms, to which are securely bolted nichrome wound mica forma, mica cased heating elements ; connections are usually made to three-plug connectors, giving series-parallel grouping and consequent heat regulation. Hot air apparatus is fitted with radiation type nichrome wound mica forma elements, mounted on porcelain bar insulators ; all connections are covered with Admiralty pattern porcelain beads. List No. 231 D, issued by A. Gallenkamp and Co., Ltd., illustrates and details the most generally used electrical laboratory appliances ; copies can be obtained on application to them.

AN ELECTRICALLY-HEATED WATER BATH

General Metal and Wood Apparatus

Laboratory apparatus in all metals and wood (not glass instruments), including every class of stills, autoclaves, water-baths, etc., are manufactured in the works of Brown and Son, Ltd., of 9, Wedmore Street, Holloway, London, which have recently been extended, and important machine tools installed, to cope with welding, brazing, spinning, and press work. New apparatus recently placed on the market includes patent autoclaves which have self-sealing covers for pressures in the neighbourhood of 1,000 atmospheres or about 6½ tons per square inch, also a highly efficient emulsifier for all usual operations, including the preparation of synthetic

milk-cream. Brown and Son's automatic water still, so well known among manufacturing chemists, film producers, and others, continues in big demand. Their catalogue includes drying ovens from one small compartment for private laboratory work, to twenty-four compartments for University examination hall work. Incubators with capsule automatic controls are also now made by the company.



STEAM JACKETTED PAN OBVIATING INSTALLATION OF STEAM BOILER

Chemists and others interested, and those contemplating new equipments of benches, fume cupboards, fume-extracting plants, etc., should apply for a copy of the new catalogue now in the press and shortly available for issue. The illustration herewith illustrates a type of steam jacketted pan which obviates the installation of a steam boiler. The water jacket is gas heated to a pressure shown on the gauge.

Quartz and Silica Ware

A handy and useful brochure (sent post free on application), entitled "About Vitreosil" (pure fused quartz or silica), is issued by The Thermal Syndicate, Ltd., Vitreosil Works, Wallsend-on-Tyne, and should be in the hands of all engineers and works managers of chemical and other allied industries, and also of all who are interested in chemical, physical, or research laboratory work. It is of a convenient size for the pocket and contains much valuable data and information regarding the many and diverse applications of Vitreosil, notes in regard to which have frequently appeared in this journal. We take this opportunity of calling attention to the change in the London office address of the above syndicate, which is now 3 and 4, Old Pye Street, S.W.1.

Refractory Ware

Electrically fused alumina, a very valuable abrasive, is also of considerable importance as a refractory. It is produced in an electric arc furnace of special construction by purifying and melting bauxite and other aluminous ores. The charge of bauxite is continuously fed into the furnace until it is completely filled with fused alumina. The molten mass, weighing several tons, is then allowed to cool and crystallise and is finally broken and crushed to grains of desired sizes. This product of the Norton Co. is known under the trade mark Alundum, and many products manufactured from it are marketed in Great Britain by Townson and Mercer, of 34, Camomile Street, London. The material is made in different degrees of purity, depending on the purpose for which it is to be used. The purest form contains more than 99 per cent. aluminium oxide. With the addition of ceramic bonds and proper heat treatment refractory articles can be obtained that have many unusual and useful properties. Pure alumina melts at 2050° C. and the bonded refractories at a temperature somewhat less than this, depending on the character of the mixture. Fused alumina itself is a very inert substance, and the bonded articles are not readily attacked by chemically active solutions. For this reason Alundum ware is very useful for filtering strong acids. Other important uses of Alundum ware are for electrical constructions and the protection of metallic resistors from corrosion.

Another Norton product which is marketed by Townson and Mercer is Crystolon—silicon carbide, which is made from pure silica sand and coke of high quality. Articles are moulded from this with ceramic bonds. Silicon carbide has important refractory properties, and when bonded with refractory clays is particularly suitable for muffles and electric furnace parts. The Crystolon bonded ware does not readily oxidise, and, with the exception of hydrofluoric acid, is not acted upon by acids. It is attacked by strong alkalis or alkali compounds and the oxides of metals at high temperatures.

Alundum products include cores for electric furnaces, laboratory combustion furnaces, etc., crucibles for laboratory and other use, incinerating dishes, combustion boats, filtering discs, cones, dishes, crucibles, plates, etc., extraction thimbles, pyrometer tubes, etc. Crystolon products include muffles (for use in furnaces heated by oil, coal, gas, or electricity), which may also be obtained in Alundum; tubes, etc. In addition a large range of refractory cements are supplied. Alundum cement consists essentially of electrically fused alumina mixed with a suitable ceramic bond. It has thermal conductivity and electrical insulating power, combined with chemical inactivity towards metals, and is therefore valuable for embedding resistor wires in flatirons, hot plates, etc. Crystolon cement is composed of silicon carbide with a suitable proportion of ceramic bond. Crystolon cement mixtures provide an acid lining, and they may be used in furnaces heated by an electric arc or carbonaceous fuel.

Townson and Mercer are sole manufacturers of the Richardson lamp for the estimation of the sulphur content of the lighter petroleum and coal tar products, and of course supply a complete range of laboratory apparatus, fittings, and reagents.

General Chemical and Scientific Apparatus

A very complete range of laboratory apparatus of all kinds is supplied by James Woolley, Sons and Co., Ltd., of 76, Deansgate, Manchester. They issue a 142 page catalogue, which deals with general laboratory apparatus; filter papers; balances and weights; pyrometers and thermometers; specific gravity apparatus and hydrometers; volumetric apparatus; sets of special apparatus, such as arsenic and carbonic acid apparatus; apparatus for fat extraction and gas analysis; nitrometers; calorimeters; optical apparatus, such as spectroscopes, polarimeters, refractometers, and colorimeters; pumps and centrifugal machines; autoclaves; microscopes and accessories; lantern apparatus, etc. In addition, the chemical department of the company supplies chemicals, reagents, and standard solutions required for analysis, for bacteriological, histological, and other work.

Optical and Scientific Apparatus

In the last few months Adam Hilger, Ltd., 24, Rochester Place, Camden Road, London, makers of scientific apparatus, have issued several new bulletins. Of these, one deals with the developments which have occurred. Notes are given on improvements which have been effected in a number of instruments. A long list is given of papers (published in scientific journals) in which Hilger instruments were used. It is of interest to note that in 1925 the sale of scientific instruments by the company was three times that of 1913, and that sales in 1925 were distributed as follows: Great Britain 32·6 per cent., British Empire overseas 13·3 per cent.,

and foreign 54·1 per cent. A further Hilger publication deals with the application of X-ray spectrography and crystallography to chemical, metallurgical, and other problems, notes being also given on the apparatus and methods used. This pamphlet contains a valuable bibliography of the subject, which is subdivided as follows: General, chemical, metallurgical and mineralogical, alloys, working of metals, fibres, and various problems.

Economy in the Laboratory

Whether for routine testing, or in the course of investigatory work, every chemist welcomes methods that simplify estimations, or make them more rapid. Needless to say, such methods replace older and more cumbersome procedure only when they maintain or increase accuracy. It is therefore of interest to review a range of products for which the manufacturers, Sofnol, Ltd., of Westcombe Hill, Greenwich, make the claim that they "save time and increase accuracy in analytical work." In regard to the question of greater accuracy, it is probable that any simplification of procedure (apart from the absolute accuracy of the results possible) will tend to raise the standard of results obtained in ordinary laboratory practice. In point of fact, these reagents represent the development of products originally devised to meet the specialised laboratory needs of the manufacturers. For many years Sofnol, Ltd., have specialised on the treatment of water for the prevention of scale and corrosion in boiler plant work which involves analysis of more than average delicacy. It was, for instance, in connection with routine water analysis that the firm found it necessary to produce a range of delicate indicators; and now a full range of Sofnol indicators is being made at Greenwich, including such compounds as *o*-Cresolphthalein and Brom Thymol Blue, as well as special mixed indicators particularly suitable for general analytical work. The accurate estimation of carbon and the evaluation of carbonates generally depend on the absorption of carbon dioxide. This has usually been carried out in potash bulbs. The preparation of liquid absorbents and the filling of absorption bulbs takes up considerable time; moreover, the use of a liquid absorbent necessitates a following tared drying tube. By the use of a solid granulated reagent for carbon dioxide absorption much time may be saved. It was long before a satisfactory reagent, sufficiently dependable and accurate for the best analytical work, was devised (where routine carbon estimations are carried out, the quantities used are considerable, and cost is an important consideration). A year or so ago, however, Sofnol, Ltd., were able to introduce what they claim to be an absolutely reliable solid gravimetric carbon dioxide absorbent. A U-tube of Sofnolite replaces potash bulbs. Sofnolite is a green granular material, which has the important property of changing colour through red to brown under the action of carbon dioxide. This enables one to observe the progress of the absorption, thus saving time, and in the case of combustions, oxygen. These, and other equally interesting products, are described in a series of booklets issued by Sofnol, Ltd., who will be pleased to send copies gratis to any interested reader.

Reagents and Chemical Apparatus

An existence of nearly 100 years is the record of the firm of J. Preston, of 208, West Street, Sheffield, who have been established since 1830. They have supplied reagents and chemical apparatus for over 50 years, having an especially large connection with steel works and coke ovens. The firm are members of the British Laboratory Ware Association, and have their own glass-blowing departments. They market all kinds of laboratory ware, and the directors have been keenly interested in the production of British laboratory glassware.

Maintenance Work in Laboratories

An important point in all laboratories is the maintenance of all the apparatus in good working order. To some extent this falls within the purview of the laboratory workers themselves, but much of the more difficult repair work can only be effected by an outside specialist. This has especial reference to such work as the repair and readjustment of balances, which is absolutely necessary if the laboratory operations are to be kept up to a high standard. W. B. Nicholson, of 166a, Bath Street, Glasgow, C.2, who supplies all requisites for works laboratories, and also keeps a well-equipped workshop for the manufacture of scientific instruments, makes a speciality of the repair and readjustment of chemical balances, of which work he has an experience extending over 29 years.

Balances

Established in London for nearly 80 years, the firm of L. Oertling, Ltd., still continues to produce balances of every kind for use in chemical and general scientific work. Among the recent correspondence of the firm is a note on a balance (still in existence) which was supplied to Dr. John Davy, brother of Sir Humphry Davy, at the end of the forties or the beginning of the fifties of the last century. Included in the more recent productions of the firm are the following:—Micro chemical and micro assay balances sensitive to ·01 and ·002 milligrammes respectively; special physical balance with Invar steel beam. This instrument is fully described in Mr. Manley's paper detailed in the *Proceedings* of the Physical Society, Vol. 38, part 5, August 15, 1926; the chainomatic balance, which the firm is of opinion should be of special interest to the works' chemist. The great saving of time (without loss of accuracy) should compensate for the additional cost. The fact that riders and weights below 1 decigramme are dispensed with, and the continual opening and shutting of the balance case during the final weighings is completely avoided, will be fully appreciated by works chemists carrying out routine weighings. The attachment can be adapted to existing Oertling balances in many instances; and the Eötvös torsion balance. This is an instrument about which considerably more will be heard in the future than in the past. In course of time it may become essential to the prospector for oil and minerals.

In the furnishing of a chemical laboratory the balance takes a very important place. In this matter British manufacturers have to contend with the fact that prior to the war balances of foreign origin were widely used, with the result that an atmosphere unfavourable to British goods was produced. Though a good deal has been done to dispel these ideas, there is still a tendency to make unwarranted assumptions in regard to the quality of foreign products. William A. Webb, Ltd., of 4 and 5, Skinner Street, London, produce chemical balances which they claim to be superior to well-known foreign instruments. Their balances are specially devised to satisfy the needs of accuracy, reliability, speed of weighing, and sensitivity. In addition, the company also specialise in weighing apparatus of all kinds and for all purposes.

Laboratory Stream-Line Filters

Two new small stream-line filters—vacuum models, in porcelain and ebonite respectively—for laboratory use have been put on the market by the Stream-line Filter Co., Ltd., of 64, Victoria Street, London. The company claims the following important features for these products: immediate, perfect, and rapid filtration; compact, sturdy, and adaptable form; easy cleaning; and long life of the filter medium. Besides affording a very handy and rapid means of demonstrating the principle of edge filtration invented by Dr. H. S. Hele-Shaw, F.R.S., these filters merit inclusion in any properly equipped laboratory for a number of useful applications to everyday work. The principle is new and has rendered possible the construction of a filter which is handy, will stand rough usage, and (leaving out of account altogether the higher degree of filtration which it gives) will be found in many cases to compete with and displace even in their own field Buchner funnels and Gooch crucibles.

The types of work for which these models are suited comprise (1) all operations on which Buchner funnels are employed; (2) those filtrations which are difficult owing to the fineness of the precipitate; and (3) filtrations of large bulks of liquid with a trace of fine suspended matter which are usually very tedious.

Dewar Flasks

Dewar flasks of all shapes and sizes, globular, cup, and cylindrical, are manufactured by the National Glass Industry, of 35, Lawrence Road, Tottenham, London. Among the special varieties produced are flasks with vertical unsilvered windows, permitting inspection of the contents. Another department of the same company deals with the manufacture and supply of other scientific and chemical apparatus, thermometers, etc.

Ionisation Potentiometers

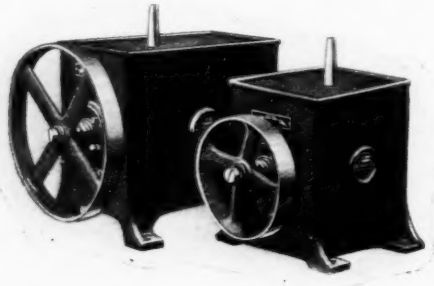
The great utility of the ionisation potentiometer in measuring the acidity of solutions is becoming so well known nowadays that it hardly needs comment. H. Linsley and Co., of Werndee Hall, S. Norwood, have developed a convenient and useful instrument of this type, together with the necessary accessories. They state that they were the first in England to adapt their potentiometers for p_H determination, at the

An Ionisation Potentiometer

suggestion of Dr. Walpole, about the time he first published his papers on this work. In addition to the apparatus for p_H determinations, the requisite apparatus for conductivity measurements has been developed in an efficient form. The conductivity measurements form part of the p_H determinations, and the whole equipment for this work can be supplied.

High Vacuum Processes

The extent to which high vacuum processes are being applied in modern industrial production is not generally recognised. Apart from the more obvious applications in such industries as electric lamp and valve manufacture, chemists are finding that the use of high vacuum is essential in many processes for producing and purifying fine organic products, such as essences, perfumes, pharmaceutical extracts, etc. The great advance in these cases is due to the low

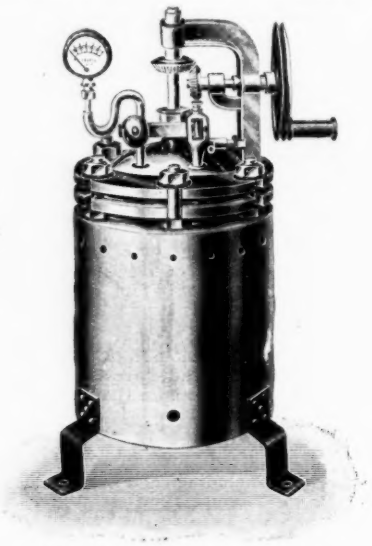


Rotary Oil Pumps: Types B and A

temperature of distillation and consequent absence of decomposition of the substances, which usually break up when using the comparatively rough vacuum of a few millimetres in common use. In a similar way products which would be spoiled by drying at high temperature, may be dried rapidly at or below normal temperature. These developments have led to the production of rotary oil-immersed vacuum pumps capable of giving vacua up to 1/10,000 millimetre without special attention, and suitable for continuous laboratory or factory service. The illustration shows both a single stage pump, type A (vacuum 1/50 millimetre) and a two-stage pump, type B (vacuum 1/10,000 millimetre). Further particulars of these and other types may be obtained from the makers, W. Edwards and Co., 8A, Allendale Road, Denmark Hill, London, S.E.5.

Laboratory Autoclaves

For many laboratory purposes, an autoclave which may be used for pressure or vacuum work, gas reactions, etc., is very useful. A laboratory autoclave of this type is supplied by the Pragos Engineering Co., Ltd., of 351, Brixton Road, London. The autoclave in question, which can be supplied in various sizes, has the following features: W.I. body with gun-metal lid, safety valve, pressure release valve (suitable



A Laboratory Autoclave

also for connecting to condenser, vacuum pump, etc.), gas inlet valve with tube extending nearly to the bottom of the pot, agitator for hand or belt drive with water-cooled stuffing-box and collar ball-thrust bearing, thermometer-pocket, combined pressure and vacuum gauge. For working with acid materials, a porcelain liner with enamelled agitator is supplied. The autoclave is provided with oil-bath, which is easily removed, and heating jacket. Other laboratory apparatus supplied by the company includes the Berthelot-Mahler bomb calorimeters, the special features being the bomb made of acid-proof steel and the patented propeller-pump water circulation.

Laboratory Benches, Tables, Etc.

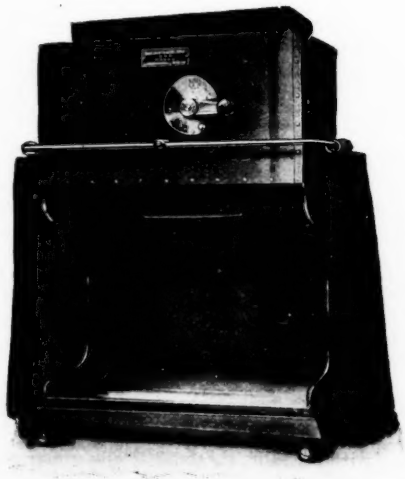
Owing to the varying sizes of laboratories, the lay-out of each has to be decided on its merits, in order that the space available may be utilised in the most economical manner

A Large Laboratory Bench Lay-out

possible. The Bennet Furnishing Co., Ltd., of 47, Glengall Road, Peckham, whose products include laboratory furnishing equipment, are prepared to suggest a suitable lay-out for any laboratory or science department if provided with a plan of the rooms available and the number of places required. They advise on the most recent and economical methods of equipment. In addition to supplying the necessary benches and fittings, they employ a permanent expert staff for plumbing, gas- and water-fitting, and electrical equipment and wiring. A special point is made of the handling of fumes and the provision of efficient fume chambers, a point which often causes difficulties in the ordinary laboratory. The plans of the company are designed to pass the requirements of the Board of Education. In their catalogue, the firm show examples of their products, including double working benches for chemical laboratories; single working benches; demonstration tables; fume chambers; combined sinks and drainers; apparatus cupboards, etc. In addition a large variety of furniture for schools, colleges, etc., of every kind is supplied by the company.

Analysis by Ultra-violet Light

Very many substances or materials show (when strongly illuminated) characteristic fluorescence, but the intensity of this is usually so weak that the special fluorescent colour (red, green, blue, etc.) is not perceptible under light from ordinary sources. The brighter the illuminant, the more intense the fluorescence, but in any case the latter cannot be seen, being overpowered by the bright light which produces it. A source of light is, however, now available which produces rays dark to the eye, possessing nevertheless sufficient actinism to give strong fluorescent effects on substances illuminated. Such a light is obtained by so filtering the light from the quartz burner, by means of a special new glass filter, that a very strong spectrum band at 3,660 A. U. stands out strongly. This band is absolutely dark to the human eye, as it lies beyond the limit of ocular visibility, which ends about spectrum band 4,000. In spectral analysis, however, the band at 3,660 shows on the photographic plate as a very broad and bright group of lines, and therefore of considerable energy content.



THE ANALYTIC QUARTZ LAMP

The new filter of the Hanovia Analytic Quartz Lamp, manufactured by the British Hanovia Quartz Lamp Co., Ltd., of Slough, represents a modern achievement of glass manufacture. It is made of glass which appears quite black to the naked eye. The sun appears dark red, seen through the filter, and the quartz burner itself very dark violet. But the effective ultra-violet rays of the quartz lamp, between wavelength 4,000 and 3,000 A. U., and particularly the band at 3,660 A. U., which are invisible to the naked eye, penetrate the glass. By means of these highly actinic rays in conjunction with the exclusion of the visible light, the characteristic fluorescence is produced with extraordinary intensity, and is plainly visible owing to the surrounding darkness. The apparatus is constructed as shown in the illustration. The quartz burner is contained in a light-tight metal casing above, and is started by raising and lowering the small handle shown. Under the burner is the special dark glass filter, through which the dark ultra-violet rays are projected into the observation chamber below.

In a paper published in *The Analyst*, 1922, pp. 106–107, A. F. Kitching points out that with such an apparatus as that now described, a means of detection is available which approaches the spectroscope in exactitude. The presence of certain chemicals can be detected in extraordinarily low concentrations, *e.g.*, 1 per cent. acetone in alcohol, quinine in water at a dilution of 1 in 100,000,000, uranium at a dilution of 1 in 1,000,000,000, etc. Most organic tissues show characteristic fluorescences. Organic secretions can be readily detected by their special fluorescing colours, traces of blood, etc., being particularly striking. The apparatus is used for such purposes in criminological work. Papers of different manufacture, although apparently alike, are very different when seen under the dark rays of the lamp. Special use has been made of this fact in detecting forgeries of postage stamps and bank notes. Precious stones usually exhibit brilliant fluorescence, while imitations appear black under the filtered light. Japanese culture pearls are clearly distinguishable from natural pearls by the same means. Fabrics of different origin can be clearly distinguished in the observation chamber, *e.g.*, wool from cotton and silk. Different kinds of fats and oils also show marked differences, and the various proteins have characteristic fluorescent colours, casein having a much stronger fluorescence than gelatine or cellulose.

A special diagnosis filter to satisfy the above purposes can be fitted to the artificial Alpine sun quartz lamp manufactured by the same company.

Control and Precision Apparatus

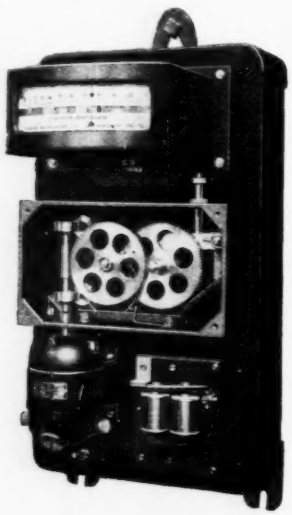
Much measuring and controlling apparatus of all kinds is marketed by the Integra Co., Ltd., of 183, Broad Street, Birmingham. Some of this apparatus is manufactured in their own works, while they also act as sole British agents for the Leeds and Northrup Co. Among the "Integra" apparatus there may be first mentioned the gas or air volume recorder, with or without counter, recording on one large chart 10 in. wide any flow of gas, whether hot, cold, cleaned or uncleaned, in cubic feet per hour. The "Integrator" gives the total volume of gas which has passed between any given moments. The equipment is employed for the volumetric control of blast furnaces, coke ovens, open hearth furnaces, cupolas, gas producers, etc. All sorts of pressure and vacuum indicators and recorders for gas, air, steam, and water are also manufactured by the Integra Co., Ltd., and special mention may be made of their single tube pressure and vacuum gauges and of their portable recorders.

The whole list of Leeds and Northrup instruments marketed in this country is very lengthy. The potentiometer recorders are claimed to be of great importance as industrial pyrometers. These instruments are simplex or multiplex and can register a number of temperatures on the one chart 10 in. wide. The potentiometric system for the measuring of temperatures has proved its superiority by the fact that at the present time 94 per cent. of all motor cars produced in the United States are manufactured with the aid of Leeds and Northrup potentiometer pyrometers. All kinds of pyrometric equipments with indicating and signalling devices are supplied to suit any special plant. The Leeds and Northrup Co. also makes a portable optical pyrometer of the disappearing filament type, which, although very robust, has the high precision of a laboratory instrument. There is also a wide variety of Leeds and Northrup electrical measuring instruments for laboratory or works practice; apparatus for capacitance, inductance and resistance measurements; for magnetic testing; for measuring the conductivity of electrolytes; for locating faults in power circuits; for the study of thermal transformation points, etc. They also manufacture a Silsbee current transformer testing set which has met with great success. Special furnace equipments for the hardening and tempering of steel (Hump and Homo methods), designed and built by the Leeds and

Northrup Co., have marked a definite forward step in the heat treatment of steel and alloys. All these equipments are built with the care that has always characterised the Leeds and Northrup line of instruments.

Automatic Temperature Controlling Apparatus

The modern laboratory—especially since the introduction of small scale industrial plants for teaching purposes—frequently finds many uses for controlling instruments of various kinds. The control of temperature is perhaps most important in this connection. A new temperature controlling device has recently been developed and marketed by the Foster Instrument Co., of Letchworth, Herts. The apparatus, which is of the pyrometric type, incorporates an edgewise indicator employing the "Resilia" construction of the moving system. The indicator carries contacts which are adjustable to the temperature it is desired to maintain. A depressor mechanism, driven by a small electric motor and a system of reduction gearing, periodically depresses the pointer of the indicator, so that when the temperature departs from the desired figure, this depression closes the primary circuit of a simple and robust relay. The consequent closing of the secondary circuit operates the control mechanism according to the type of furnace or other apparatus under control. Both primary and secondary contacts are of pure platinum and the secondary, which carries the heavier current, is adjustable for wear if that should be found necessary after long use. The gear box mechanism has only an operation



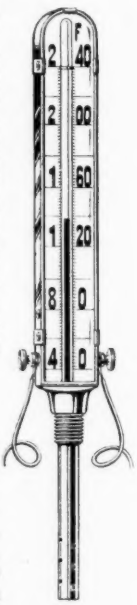
Automatic Temperature Controlling Apparatus

which might be termed permissive; its function is to release a spring-maintained detent, thus allowing a presser bar to depress the pointer under the influence of a small force of gravity. Thus the forces in the gear box are large, and reliable service is assured over long periods, but these forces themselves cannot cause damage in the indicator. The motor which drives the gears is arranged for running from an ordinary lighting circuit, the power consumption being negligible and, as it will normally work at a small fraction of its rated capacity, long service is assured. A very interesting feature of this automatic control is the "broken couple alarm." The correct operation of this system of control depends, of course, on the continuity of the circuit in the thermo-couple itself. In the Foster apparatus, if the thermo-couple fails the pointer is automatically moved to the top of the scale and, through an extra pair of contacts in the indicator, is made to give audible warning of the fact or, if preferred, to operate the control mechanism to check the heating until the thermo-couple is replaced. Without this device, the failure of the thermo-couple would cause the pointer to fall towards zero and thus the mechanism would tend to increase the heating in the furnace. The whole mechanism, together with the indicator, is mounted on a metal base board arranged for hanging on a wall or other suitable support.

Time Punches for Recording Instruments

A time punch which provides a means for recording each reading of the chart is now being fitted by the Budenberg Gauge Co., Ltd., of Broadheath, near Manchester, to all their recording instruments (for pressure, temperature, speed, or draught) using circular charts. The time punch is a very simple device. It is operated by pressing a button on the outside of the case of the instrument. This punches a hole instantaneously in the border of the chart opposite the time line corresponding to the time of reading. The number of readings of chart can therefore be recorded, negligence on the part of operatives being thereby rendered evident.

Thermometers and Pyrometers



Insulated thermometers for use in acid and alkali liquors and chemical thermometers for dye works, chemical works and general factory use, are the speciality of S. Sugden, Ltd., of 180, Fleet Street, London. They are also large manufacturers of thermometers for engineering plant, these instruments being fitted with strong gunmetal casings and magnifying lens in front to facilitate reading of scale and mercury column. The illustration shows a Sugden magnifying thermometer which is provided with electric contacts which can be connected to an electric bell circuit, giving an alarm when the temperature rises to any determined maximum. The firm also supply specially designed pyrometer couples and electric temperature indicators and recorders for furnace and high temperature work generally.

Recorders, Etc.

The increasing application of science in industry is shown by the interest which is being taken in all kinds of precision apparatus. The Drayton Regulator and Instrument Co. supply a large number of products of this kind. Included among them are pressure recorders, employing a helical Bourdon tube mechanism for the higher ranges and a bellows or diaphragm for the lower. The movements are of great simplicity, ensuring freedom from backlash. The "Union" combustion recorders (for carbon dioxide, or combined carbon dioxide and monoxide) are supplied by the same company. These recorders are non-electrical and non-chemical, and are claimed to have high accuracy and very small time lag. Another interesting instrument is the Drayton automatic de-superheater or attemperator; the 4 in. variety reduces 8,400 lb. of steam per hour from 100 lb. per sq. in. 700° F. to 100 lb. per sq. in. 338° F., and can be supplied complete with an automatic temperature regulator for automatic control of water to the de-superheater sprays.

Picture Projection by the Episcope Method

By means of the Episcope, pictures may be projected on to a screen without films or slides. The apparatus projects any object placed on the object table, in the exact colours of the original. Diagrams, photographs, illustrations from books, crystals, sections, and objects of all kinds may be thus transmitted with great magnification. Sands Hunter and Co., of 37, Bedford Street, Strand, London, supply a number of forms of the Episcope and Epidiascope for use in schools and colleges, lecture rooms, workshop demonstrations, etc. Particular attention may be drawn to their school projection outfit (fitted with the arc light body and vertical and micro-projection attachments), which they claim to be the most complete projection outfit on the market. By its means it is possible to show not only all the objects above-mentioned, but also transparent objects, the nature of which requires a horizontal position; physical and chemical experiments such as the formation of crystals; microscope slides; small live insects, etc.

Moulding Machines for Cast Iron

Discussion among Chemical Engineers

At a meeting of the Chemical Engineering Group of the Society of Chemical Industry, held in the private theatre of the American Film Co., Wardour Street, London, on Monday, Professor J. W. Hinchley read a paper on "Permanent Moulding Machines for Cast Iron," in which he described a plant used by the Holley Carburetor Co., of Detroit, U.S.A., for the making of small castings of cast iron in permanent cast iron moulds mounted on a rotating platform. He also exhibited a film showing the process of making these castings. Mr. F. H. Rogers (chairman of the Group) presided.

Cost-Saving

Professor Hinchley said that any method by which a reduction of the cost of production of machinery could be made must always command the respectful attention of every engineer. The cost of castings was an important item in the cost of production of a machine. The quality of these castings, in their accuracy of size, uniformity of material, freedom from porosity or blowholes, etc., also played a very important part in the ultimate cost of the machine. Any method by which the cheap production of castings was obtained without improvement in quality might be an advantage, but it was fortunate that in the mass production of manufactured articles there seemed to be a law that the very lowest costs were obtainable only by the highest achievements, both in accuracy and in quality.

The preparation of moulds for single castings, either in sand or in other material, was a very inefficient procedure, and every engineer who had faced the problem of large outputs must have considered the production of more or less permanent moulds. In the production of castings of low melting point metals, permanent moulds presented few difficulties, and in some industries such moulds had been known for a very long time. The use of a horizontal rotating table upon which moulds were placed and subjected to different processes during the revolution of the table was a well-known scheme, the Wick's rotary type casting machine being an example in point. The use of permanent moulds for such materials as aluminium was also well known, and there were great advantages to be obtained from such methods. It was an invariable experience that such alloys were stronger when cast in chills than when cast in sand. With cast iron, however, the difficulties of using a permanent mould were increased. Chilling of the metal and destruction of the mould were points of serious importance in the centrifugal casting process. A permanent iron mould was used, but the metal must be annealed after casting, or the product was useless. In the motor car industry there was a great demand for the permanent mould, and such permanent moulds for cast iron offered enormous possibilities of economy in the production of the motor car and in the displacement of brass for many purposes.

Advantages over Sand-castings

The Holley Carburetor Co. had developed such methods for the production of carburettors and other parts. There were usually twelve moulds on a rotating table. The table rotated once in two minutes, the workmen carried out the various operations required during the rotation, and in the two minutes twelve castings could be produced. The castings were remarkably accurate, and in this connection he exhibited a sample of a piston produced by this plant, showing that the thickness of the webs was very uniform. The ordinary sand castings could not be produced over and over again with such accuracy as that with which castings could be produced in the permanent moulds. The moulds in the Holley Carburetor Co.'s plant were made of cast-iron, and lined with a refractory material, the thickness of the lining depending to some extent on the amount of metal to be cast. The refractory lining consisted usually of two parts. The first part was a cementing material—a clay substance which was adherent to the iron. On top of that there were a series of layers of refractory material, each one being dried and fritted by heat, giving the lining of the mould the properties of a brick. The porosity of the lining must be very small indeed, in order to avoid the production of tentacles or fibres of metal, which would tend to pull the mould to pieces. A coarse refractory lining would have a very short life. The refractory lining alone, however, was not sufficient to give the rate of cooling which was desirable in order to retain the properties of the cast iron, so that, just before pouring, the lining was coated with a very thick layer of carbon, deposited by an acetylene flame. No gases must be evolved when the metal came into contact with it.

Obviously the thickness of the lining had a bearing on the rate of cooling. One would expect to have to choose carefully the iron used, in order to avoid chilling or crystallisation, but, as a matter of fact, many classes of irons had been used with perfectly satisfactory results. The irons of America, however, were usually softer than those used in this country, and, as a rule, there was a preference for high-silicon irons. The iron which gave the best results contained from 2·5 to 3·5 per cent. of silicon. On the whole the cast iron used was not very different from the ordinary cast iron of the foundry, and no particular pains seemed to be taken to obtain a superior metal.

Results of Tests

Examination of the material after casting showed that it was cast much better in these permanent moulds than in sand moulds. For instance, although the hardness was about the same, the tensile strength was increased from 20,000 to 27,000 lb. per sq. in., and the compressive strength from 52,000 to 71,000 lb. per sq. in. The metal was close grained, had a much finer structure than that cast in sand moulds, and was free from blowholes.

The parts of the moulds were held tightly together by toggle joints. The moulds were filled while the table on which they were fitted rotated. In the course of its travel, the moulds were opened, and pins were provided for ejecting the castings automatically. As soon as the casting was ejected from any mould a blast of compressed air was blown into the opening of the mould in order to clean it thoroughly. The surface of the mould was then smoked heavily by means of the acetylene flame, the dry cores were inserted, the mould closed, and again filled with molten metal, the operations being then repeated. Every morning the moulds were inspected, and any defects of the surfaces were made good. The refractory might be any ordinary material used as a refractory, such as ordinary fireclay, but silicate of soda and potash were used to a larger extent as a binding material.

The moulds were rather expensive in first cost. When it was realised, however, that each mould had turned out something like 20,000 castings, and, he believed, none of them had yet been replaced, it would be appreciated that the cost of the mould per casting was negligible. Under normal circumstances, small castings were poured and ejected from the mould in about ten seconds. The rate of working was such that the head was very often still molten when the casting was ejected.

The uniformity of the castings, their freedom from porosity, and soundness, made it possible to use this material in cases where the use of brass was formerly considered necessary, thus effecting considerable economy. The cost of carburettor castings had been reduced by about 70 per cent. as compared with the cost before this process was put into operation. When heavy castings were produced, the process was necessarily slower; the table must rotate more slowly, and a blast of air might be necessary for cooling the moulds. Normally, casting took place in a mould at a temperature of about 400 deg. C. One man could readily pour 400 small castings per hour. At the Holley Carburetor Co.'s works there were eight machines in use, having a capacity of 40 tons per eight-hour day. The floor space occupied by the machines was only 2,700 sq. ft.

Points in Discussion

In the course of the discussion Mr. S. J. Tungay suggested that this method was applicable only to the production of small castings which were required in very large numbers. He was convinced that special care had to be taken in selecting the quality of iron used for producing castings of this character, because if one chose too hard an iron, or one which would shrink considerably when cooling, a considerable number of wasters would be produced by these methods. He was surprised to find that in such a modern American factory as that of the Holley Carburetor Co., the moulds were filled by hand pouring from ladles. In centrifugal pipe and piston ring casting methods which he had watched in this country the molten metal was conveyed to the moulds from the furnace by gutters, there being also an arrangement for stopping the flow of metal at any particular time. Doubtless a fair number

of scrap castings were produced, but, inasmuch as they were produced so very cheaply, probably, in the aggregate, the wasters represented a more or less negligible quantity.

Mr. J. E. Fletcher, who had seen the plant at work, said that a great deal of time had been devoted to experiment before the exact composition of the metal to be used had been arrived at. It was not metal which we in this country would call high class, and if it were not for the fact that it was poured into metal moulds and cooled quickly, the castings would be unsound and coarse grained. To see the plant in operation was an inspiration. The metal was quite good enough for the purpose for which it was used, and the castings stood up to the pressure to which they were subjected.

Mr. V. C. Faulkner (president of the Institute of British Foundrymen) suggested that the Holley Co.'s process might be applied with advantage in this country to the making of chairs for railway rails. It might be taken for granted that this process was one based on the thermal history of cast iron, and the Holley Co. had been successful in arranging cooling conditions so that their production was definitely a grey iron of suitable properties. He was not convinced that a refractory lining was necessary, however, and it was conceivable that a method could be evolved whereby similar castings could be made without refractory linings being used.

Professor Hinchley, replying to the discussion, said that a normal analysis of the cast iron used was: Total carbon, 3·5 per cent.; silicon, 2·55 per cent.; phosphorus, 0·285 per cent.; sulphur, 0·085 per cent.; manganese, 0·065. The silicon and manganese contents were perhaps a little high, but he would not call the iron a very special iron.

The Theory of Strong Electrolytes

Some Impressions of the Faraday Society in Oxford

(From a Correspondent.)

From time to time a chemist or physicist devises some simple theory which seems to elucidate the hitherto unrelated facts of science; the advent of such a theory acts as a tremendous incentive to research, and workers all over the world are shown new fields to investigate. It not unnaturally follows that the original theory requires modification in the light of the new information which is secured, and in the course of time the crying need is for the workers in this new field to get together and hammer out their differences.

The Faraday Society has established a reputation for bringing together workers from all parts of the world whenever a subject in physical chemistry has reached that stage of development which calls for general discussion. The reports of past discussions are recognised as complete summaries of the knowledge of their time. They are more than text-books, since contributors have not merely summarised existing knowledge, but have contributed their latest discoveries, have given voice to their doubts and perplexities and, perhaps, have had those doubts and perplexities solved by other contributors; at least, the way has been shown to their solution.

The Debye-Hückel Theory

The successful meeting held in Oxford on Friday and Saturday last week has fully maintained the Society's reputation. In 1923, Professor Debye and his able-pupil Dr. Hückel, working at Zurich, propounded a simple theory for the conductivity of dilute solutions of strong electrolytes, by taking into consideration the electric forces acting on the ions in the solutions and the frictional forces due to the impacts of molecules one with another. For more than three years work has been carried out along lines suggested by the conceptions of Debye and Hückel, and many apparent discrepancies required explanation. The introductory paper on Friday was by Professor Debye, who unfortunately had a prior engagement to lecture in America; the paper was, however, given by Dr. Hückel, who spoke in German. Dr. Hückel is now working at Göttingen, and it was fitting that the next paper should be contributed by Dr. Lars Onsager, his successor in Debye's laboratory. Those who were at Oxford will agree that none created a greater impression than this fair-haired young Norwegian. He had not previously been in England, but he spoke perfect English and combined an obvious mastery of his subject with a delightful sense of humour. In the course of the discussion which followed his paper, one speaker having expressed a desire to ask two questions proceeded to compress some half-dozen questions into the second one. The roar of sympathetic laughter which greeted Dr. Onsager's reply that he had not fully understood the question gave way to admiration when he proceeded to give what appeared to be the answer. Dr. Onsager's paper expounded his revision of the Debye-Hückel theory, wherein he takes account of the Brownian movement of the central ion. Professor Fajans of Münich read a paper on the refractometric evidence for the existence of undissociated molecules and complex ions in solutions of strong electrolytes. Fajans also spoke in English and quickly secured the ear of his audience by his enthusiastic treatment of his subject, no less than by the assured manner in which he met subsequent suggestions and criticisms.

Electrolytic Transference

Professor Remy of Hamburg read (in German) his paper on "Electrolytic Transference," and his method of presentation was a model which might well be followed more widely. Although speaking in a foreign language he was able with the aid of lantern slides to make his subject-matter perfectly clear even to those who understood German but very imperfectly. At this stage, with only 4 out of 26 papers presented, the end of the first day was reached, and it seemed that the whole of Saturday would give far too little time to conclude the programme.

Dr. Ulich, who is working with Walden at Rostock, opened the proceedings on Saturday with a paper (read in German) on "Ionic Mobilities in Non-aqueous solutions." Papers by General Hartley and his co-workers dealing with the mobilities of elementary ions in methyl alcohol and in other solvents, a communication from Professor MacInnes of the Rockefeller Institute, New York, and a paper by Dr. Ferguson and Mr. Vogel on the agreement with experiment of the dilution formula deduced from the Debye-Hückel theory, were all taken as read.

This concluded the first half of the programme, to the discussion on which all the readers of papers, together with Professor Hevesy of Freiburg, Professor Andrade, Professor Lowry, Professor Brönsted of Copenhagen, Mr. C. R. Bury, Professor Bjerrum of Copenhagen, Professor Bragg, Professor Allmand, Professor Porter, Mr. R. H. Fowler, Mr. R. T. Lattey, Mr. Wynn Jones and the president had contributed. The discussion had from time to time waxed lively, although in the best possible humour.

Second Part of the Programme

The second part of the programme was opened with an able report on "The Activity of Electrolytes," by Professor Brönsted of Copenhagen. Mr. R. H. Fowler followed with a mathematical paper in which he developed the Debye-Hückel theory from the fundamental principles of statistical mechanics. It is feared that many who had seen this paper in advance proof had given it up as hopeless, but Mr. Fowler is a good lecturer and proved our fears to have been groundless. Professor Bjerrum of Copenhagen analysed the anomalies and discrepancies in the Debye-Hückel theory, and sought to show how they could be met. Professor G. Scatchard had travelled from Boston, Massachusetts, to give his paper on "Mixed Solutions of Electrolytes and Non-electrolytes," and Professor Harned had come from Philadelphia to speak on the thermodynamic properties of a few concentrated salt solutions. Previous speakers had already made generous reference to the work done in America, so that it was particularly gratifying to have the opportunity of meeting the two leading experts of the American school. Papers by Professor Kraus and Professor Randall were also contributed from America. Papers by Mr. Foxton and Dr. Shutt on "The Activity of Zinc Chloride," by J. H. Wolfenden and his co-workers on "The Use of Amalgam Electrodes," by Professor Partington and Dr. King on "The Electrochemical Properties of Non-aqueous Solutions," by Professor Lowry on "The Definition of Strong Electrolytes," by Dr. Millet on "The Activity of Hydrogen Ion in Mixed Solvents," and by Dr. Adair on "Protein Ions" completed the programme. The discussion on this part of the programme was equally keen. Only the necessity for catching trains away from Oxford could induce the meeting to break up at about 4.30 on Saturday afternoon.

No attempt can be made in these few lines to summarise the scientific matter presented at the meeting. The papers extended to about 120,000 words, and as most of them were taken as read, two days of apposite and by no means redundant discussion have to be added to this mass of information!

Members of the Society and guests were accommodated at Jesus and Lincoln Colleges, and an informal dinner was held on Friday evening in the Hall of Exeter College, where for a time other things than strong electrolytes were discussed in pleasant surroundings, but after dinner it was found that the discussions of the day showed a tendency to resume far into the night. In all some 140 were present at the meeting. The friendships made with men known only through their work will have repaid those who devoted two days to the meeting, but the wide interchange of knowledge has been of immense value. In any case we were still under the influence of the summery portion of April, and Oxford at any time, and particularly in spring, is a delightful place for a meeting.

"Organisation in the Chemical Industry"

To the Editor of THE CHEMICAL AGE.

SIR,—Permit me to offer a few more observations and a suggestion on the question of "Organisation in the Chemical Industry," which arise from the correspondence in your valuable paper.

The position of the Institute of Chemistry will, I think, remain pretty well as it is now—an institute for the consideration and propagation of abstract theories and chemical practice generally.

The position of the British Association of Chemists appears to me to be an anachronism. As "Colorimeter" rightly says, unification with the National Union is both desirable and necessary. Unfortunately, you cannot make omelettes without breaking eggs, and you cannot unify without some re-arrangement of officials. But I have no doubt that all difficulties of this character can be overcome and it only remains for the British Association to make up their minds.

The National Union covers the whole industry. It has the highest rates of salaries and wages in the industry. It is an Industrial Union. All sections—retail, public service, industrial chemists, manufacturing, and wholesale—are represented on the National Executive Council.

The Union's rate or salary for qualified chemists is £400 per year; hours 39 per week, with overtime rates and 21 days' annual holiday. Consequently I am shocked to read that Mr. Rhodes on behalf of the British Association recommends a salary of £350 per year for qualified chemists. I hope Mr. Rhodes will qualify his statement without delay, or he may do harm to the chemists he desires to assist.

There is one drawback to the organisation of chemists that requires facing frankly, namely, snobbishness. A Treasury note has the same value whether paid as salary or as wages. I remember when it was fashionable for young men to become engineers. Now they become chemists. The technical colleges and secondary schools are pouring them into the industry by the hundred.

The other day my attention was drawn to a case in point. At a large up-to-date secondary school that shall be nameless a letter was read from a large chemical firm offering to find employment for the cleverest students in chemistry. From the secondary school to the laboratory. Then where? This firm wants youths of ability in its laboratory, not qualifications apparently.

To depend on public opinion altering this is hardly a wise policy. Providence helps those who help or try to help themselves. Furthermore, medicine and law are professions for the individual. Chemistry, however, is now the leading industry run by large commercial firms in which the chemist, qualified or unqualified, is merely one of a number; very often only a number on the time clock. Consequently, for Mr. Rhodes or anyone else to talk of "restricting the practice of chemistry to properly qualified persons" is simply talking without regard for the irrefragable facts.

The tendency is and must be for salaries of chemists, assistant chemists, and such like workers to decline as the firms recruit the secondary school boys; unless such workers join their trade union and by organisation and collective bargaining maintain their rates and conditions.

The agreement of the National Union is in my judgment one of the finest agreements in the country. Arbitration is provided for cases of difficulty and contention. As the agreement becomes known, it is accepted as the wisest and soundest policy for the British chemical industry.

If, therefore, we cannot have immediate unity in our organisation, I suggest we set up a Chemical Industry Joint Council made up of responsible representatives of the Institute of Chemistry, the Institute of Chemical Engineers, the British Association of Chemists, and the National Union of Drug and Chemical Workers. This joint council would, I believe, be of incalculable benefit to the industry generally and to all who are in it. One of its purposes would be to secure a charter for the registration and qualification of all grades of chemists. The joint council would enable the doctor of science, the professor, the chemist (qualified and unqualified), the process worker, and other grades to meet in common council.

This seems to me the first and most practical step to be taken, and if our friends in the several organisations specified will indicate their agreement, or suggest a better policy, the chemical industry will soon be united in council and purpose. Further, the joint council's first resolution should be a hearty vote of thanks to the Editor of THE CHEMICAL AGE.—I am, etc.,

T. WILSON COATES,
National Organiser.

National Union of Drug and Chemical Workers,
April 25.

SIR,—It is interesting to follow the correspondence running through your columns on the organisation of chemists, but I am afraid the comparative paucity of replies would indicate that the subject is not of interest to the majority, though there is every reason why it should be.

In a previous letter I endeavoured to sketch the present state of the profession and no one has contradicted my statements, strong though they were. My good friend Mr. Rhodes (who deserves exceedingly well of his generation) thinks my outlook a gloomy one, and finds comfort in the thought that his Association have laid down £7 a week as a minimum salary for the chemist. To have laid down a standard is one thing; to be strong enough to enforce it, another; and I doubt the powers of the Association, excellent though their intentions undoubtedly are. At the same time £7 a week is hardly my idea of what a salary for a chemist should be, and his statement does much to prove my contention that many of us are at present paid on a similar scale to a commercial traveller or works foreman.

I cannot but agree with the constructive letters which have recently appeared, but I do not think the heart of the problem has been really touched, although Mr. Rhodes was very near when he spoke of the "desire for unity."

Nothing can be done until this "desire for unity" takes concrete form and becomes, not an idle day-dream, but work for our hands to do. Most of us have a desire for unity, but is it sufficiently strong to move us to any effort towards its fulfilment? Many of us are already members of various organisations, captained by men who are filled with zeal for the welfare of their fellows, but do we co-operate in any way beyond sending our annual subscription? If the smallest of our societies could be filled with men determined that their views should be accomplished facts, unity in the profession would be with us before we were very much older. Unity is our only hope, and sometimes its light would appear to be sadly dimmed by the apparent apathy of the majority or by squabbles between sections of our commonwealth. "Where there is no vision the people perish," and vision is, in my opinion, our premier need. Given amity of thought, earnestness of purpose, and a feeling of individual responsibility, the programme of action is in itself a subsidiary matter, and the goal surprisingly near.—Yours, etc., OBSERVATOR.

April 26.

Economic Rally in Birmingham

THE Midland Counties Economic League organised a "Crusade for Capitalism," which took place in Birmingham and district. Open-air meetings were held in numerous centres, and the crusade was wound up at a mass meeting in the Town Hall on Thursday. The speakers were Sir Ernest Benn, who spoke on "The Benefits of Capitalism," and Mr. H. J. Gillespie, ex-lobby correspondent of the *Daily Herald*, on "Why I Left the Socialist Party."

Oils and Fats in South America

(From a Correspondent.)

South America should prove one of the chief sources of the world's supply of oils and fats, the demand for which is constantly increasing. The greatest difficulty in the way will probably be a lack of suitable labour, and this, of course, involves a certain amount of unwillingness on the part of capital to embark on development schemes. In other parts of the world a large proportion of the actual work of cultivation and collection of oilseeds and nuts is undertaken by the natives or small farmers, as in West Africa, India, and China; although in certain localities, in West Africa at least, there are large plantations on the European plan. In South America, however, it seems that large plantations of the European type will have to be the rule, and this will mean a larger initial outlay of capital, to say nothing of that required for improved transport. This need for European capital and enterprise is perhaps less urgent in Brazil than in any other South American State, for the Brazilians themselves are now fully alive to the vast resources of their country in oleaginous plants and trees, and are doing a great deal in the direction of necessary development.

Linseed.—The principal South American oilseed known to commerce at present is Argentine linseed, the area under which is approximately 3,000,000 acres, exceeding that of any other country in the world, including even Russia before the war, and the yield is over a million tons per annum. During the war a large part of the Argentine export trade in linseed was diverted to the United States instead of Europe, and the U.S.A. is still the chief buyer. Linseed is also grown to some extent in Southern Brazil, and there is a small seed crushing mill for the production of linseed oil in Sao Paulo. In the Argentine the production of linseed oil is on a comparatively small scale. There are four or five Italian oil mills in Buenos Aires, with a total output of about 7,500 tons of oil per annum, and another mill at Rosario under Dutch control.

Palm Nuts.—There are numerous varieties of palm trees, especially in Brazil, and to add to the confusion the same tree or nut is often called by several different names. The chief of these is the cohune, corozo or coquito nut, which is abundant in British Honduras. Small supplies of these nuts have been sent to England, and reported on by the Imperial Institute, but the chief problem is the extremely hard shell and the difficulty of designing a suitable machine for cracking the nuts. This and other kinds of South American palm resemble the West African palm in the fact that two different kinds of oil can be obtained from the fruit, the oil from the outer fleshy pericarp corresponding to the palm oil of West African commerce, and the kernel oil corresponding to West African palm kernel oil.

Coconuts.—In South America, as in other tropical countries, millions of coconuts are wasted annually or only used to a very small extent by natives. The coconut palm is abundantly distributed throughout tropical America, especially along the northern coast of Honduras and the Guianas, also Brazil. It is estimated that the last-named country has about 1,250,000 coconut palms, producing annually 50,000,000 nuts, but the trade in these is mostly only local. There is unlimited scope throughout tropical South America, especially along the northern coasts, for the establishment of coconut plantations. Development in this direction may probably be stimulated by an increasing demand from the United States for coconuts and coconut products, but at present this large and growing market is chiefly supplied from the Philippines and to a much less extent from Japan. The trade in coconut oil between Japan and the U.S.A. which, during the war and immediately thereafter, grew to a phenomenal extent, has now very considerably declined. The comparative nearness of the northern coasts of South America to the United States should induce the latter country to turn in that direction for its coconut oil instead of looking to the far-distant Philippines. During the war the imports of copra and coconut oil into the U.S.A. increased sevenfold, reaching their maximum in 1918, namely, 250,000 tons of copra and over 100,000 tons of coconut oil. These huge imports were chiefly used in the manufacture of margarine and other edible fat preparations. The U.S.A. is not the only market available.

Cottonseed.—Cotton is grown in several South American countries, chiefly in Brazil. That enterprising state is now offering every encouragement to the cultivation of cotton and the establishment of a corresponding textile industry, and it already possesses several hundred cotton mills. The crushing of the seed is directly encouraged by the granting of financial help, and the industry should soon be set firmly on its feet with its future well assured. Cotton is also grown in Peru, Colombia, Venezuela, and the Argentine (10,000 acres).

Castor Beans.—The valuable properties of castor oil as a lubricant for aircraft engines led to a great extension of castor bean cultivation in many countries, and India's almost complete monopoly of this trade was seriously threatened, especially by Brazil. The trade in castor beans and oil in Brazil, unlike many of the mushroom growths of the war period, is being stoutly maintained and shows less decline than any other oleaginous product. The export of beans and oil in 1915 were only 234 and 8 tons respectively, but in 1918 they were 4,066 tons of beans and 3,830 tons of oil; in 1919, 23,700 tons beans and 1,389 tons oil; and for the first six months 1920, 15,570 tons beans and 450 tons oil. Most of the seed has been sent to the U.S.A., with smaller quantities to the United Kingdom, Portugal, Belgium, and Germany; Italy, Spain, and France have taken most of the oil.

Peanuts, etc., are found in all parts of South America, and are crushed for production of the valuable edible oil in Brazil, Uruguay and the Argentine. Exports of peanuts from Brazil average more than 1,000 tons per annum. There are numerous other oilseeds and nuts which could be produced in South America in large quantities. In some cases the plants and palms grow wild over large areas, and among the foremost of these is the *babassu* nut of Brazil, yielding up to 65 per cent. of oil.

Structure of Molecules in Liquids

The Work of Dr. C. V. Raman

In a lecture a short time ago at the Indian Museum (writes a Madras correspondent), Dr. C. V. Raman, F.R.S., gave an account of his recent work on the application of X-ray methods to the determination of the structure of molecules in liquids and gases. He first of all dealt with the work of Sir William Bragg and his son, and others, on the structure of crystals.

Dr. Raman said that the interpretation of the structure of chemical molecules by work on solids was made complex by the circumstance that in a solid they were not dealing with single molecules but a closely packed array of them. Though in theory the ideal method would be to study the scattering of X-rays by the discrete molecules of a gas or vapour, in practice, however, serious technical difficulties had yet to be overcome. He was himself attempting to get X-ray patterns of the molecules of gases. The case of liquids as a compromise between the solid and the gas was of considerable interest. In his own laboratory at Calcutta he had effected considerable improvement in experimental technique. He had obtained clean pictures of the X-ray patterns of liquids without confusion from the walls of the containing vessels.

X-Ray "Haloes" Given by Liquids

In these pictures, round the central spot which corresponded to the incident pencil of rays, there was to be seen a diffraction-halo or aureole, which was fairly sharply defined. The formation of the X-ray haloes was ascribed by Dr. Raman to the uniformity in size of the various molecules and also the relative regularity of their arrangement within a liquid. Dr. Raman claimed to have discovered that the halo was not only of different size in different liquids, but also exhibited in individual cases a certain distinct structure very characteristic of the molecules with which he experimented. For example, the two substances hexane and cyclohexane, when exposed to X-rays were found to differ fundamentally in the geometry of their molecules. Cyclohexane gave a very sharp and intense halo, while ordinary hexane gave a less intense and relatively diffuse halo.

Benzene and its derivatives were also investigated by Dr. Raman. He arrived at the conclusion that very remarkable and characteristic changes in the structure of the halo appeared when one or more of the hydrogen atoms in the hydrocarbon ring were displaced by other atoms or chemical groups, and sometimes even when one and the same replacing group changed its position in the molecule.

Successor to the Late Dr. Crossley

Dr. R. H. Pickard, F.R.S.

THE Council of the British Cotton Industry Research Association has appointed Dr. R. H. Pickard, F.R.S., as Director of Research, in succession to the late Dr. A. W. Crossley.

Dr. Pickard, who is 52 years of age, is a graduate of the University of London (D.Sc.), of the University of Munich (Ph.D.), and of the University of Birmingham (B.Sc.). He was elected a fellow of the Royal Society in 1917.

The new Director goes to Manchester from the Battersea Polytechnic, of which institution he has been Principal since 1920. He has there been controlling a staff of upwards of

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DR. R. H. PICKARD, F.R.S.

300, providing instruction for about 4,000 students. In addition to the heavy responsibilities of this post, Dr. Pickard has also been acting as Director of Research for the British Leather Manufacturers' Research Association since 1920. He is on the Councils of the British Launderers' Research Association and the Boot and Shoe Research Association, and on the Adhesives Committee of the Department of Scientific and Industrial Research. Besides being a senator of the University of London, a recognised teacher of organic chemistry there, and a member of its Standing Committee of Convocation, Dr. Pickard has acted as occasional examiner for higher degrees at the Universities of St. Andrews and Birmingham. He has served as a nominee of the President of the Board of Education on the examination board of the City and Guilds of London Institute, as well as on the Board of Examiners of the Institute of Chemistry. He is a vice-president and member of council of the Institute of Chemistry, and is on the council of the Chemical Society.

Dr. Pickard was formerly head of the Chemical Department of the Blackburn Municipal Technical College from 1899 until his appointment as Principal of that institution in 1905, which latter post he held for 15 years. He has also served on the council of the Textile Institute, Manchester.

Ebonite Products

"BECOL" ebonite, a pure rubber-sulphur product, free from fillers, is used in all kinds of scientific and electrical instruments. The makers, the British Ebonite Co., Ltd., of Hanwell, London, state that it has excellent properties of insulation, turning, and finish. It is supplied either in the black form, or in the highly artistic "grained" form. The company's products include ebonite rods, sheet, tubes, mouldings, accumulator cases, pump rings, special sections, etc. In addition, the company also supplies "Becolate" (super "Stabalite"), a material made specially to stand heat and wear. It will stand higher temperatures than ebonite.

A Lister Centenary Exhibition

FITTINGLY to commemorate the hundredth anniversary of the birth of Lord Lister, a Lister centenary exhibition has been arranged at the Wellcome Historical Medical Museum, London, and the permanent Listerian collection has been augmented for the occasion, the exhibits being arranged to throw light on every side of Lister's life. The scientific section of the exhibition reveals Lister's almost superhuman passion for cleanliness in surgery, and shows clearly the thoroughness with which he undertook any investigation.

One large case illustrates the evolution of antiseptic solutions, sprays, plasters and dressings, chief among which stands carbolic acid, with which Lister's name is bound up. Gut ligatures, which have rendered possible operations that no surgeon in pre-Listerian times would have attempted, are well to the fore, there being several examples of catgut treated with carbolic acid, with tannin and chromic acid, with corrosive sublimate, and with bichromate of potash. It is interesting to compare the modern methods of keeping ligatures sterilised with the pre-Listerian practice of placing a bunch of cord ligatures in a buttonhole during an operation.

Foremost among the apparatus of historical interest shown is that with which Lister conducted his experiments on the germ theory of putrefaction and on the lactic fermentation of milk, by means of which he disproved the theory that these actions were due to oxygen in the atmosphere. Apart from his pioneer work in germ theories and in antiseptic surgery, which in many cases raised strong opposition, Lister spent much time in designing apparatus necessary for the new practices he was evolving, and all these have their part in the exhibition.

The general impression left by this exhibition is one of the thoroughness with which Lister went into every detail of his investigations, as witness his exhaustive research for an ideal antiseptic dressing, his great care in his germ experiments, all of which go to show the patience and ingenuity with which he fought against uncleanliness in surgery.

Helium in Canada

THE Mines Branch of the Dominion Department of Mines at Ottawa has just issued a report by Dr. R. T. Elworthy, entitled "Helium in Canada," which gives a brief account of the resources, together with details of the methods employed in analysis and extraction, and also an outline of the progress which has been made in the United States. Some possible industrial uses of helium are also reviewed. The results of this investigation show that the available supplies are insufficient to furnish the great volumes of helium that would be necessary to supply the commercial airships of five and six million cubic feet capacity that are now under construction in Great Britain. Whether or not other possible uses are of sufficient importance to warrant the extraction of smaller amounts of Canadian helium remains to be seen. A committee of the National Research Council of Canada has had the subject under consideration for some time, and it is hoped that an experimental extraction station will again be put in operation to determine the most efficient processes to be applied to Canadian gases and to ascertain actual production costs on a commercial scale. The results of the necessary preliminary work, a survey of the available sources, are presented in this report. Copies of the report may be obtained by those interested on application to the Natural Resources and Industrial Information Branch, The Canadian Building, Trafalgar Square, London, S.W.1.

The Dyers' Wages Dispute

REPRESENTATIVES of the Allied Association of Bleachers, Dyers, Printers and Finishers, and of the Joint Dyers' Executive Committee, met in Manchester, on Friday, April 22, to consider the cancellation of the Mackenzie Award at a date to be agreed upon, provided the employers were prepared to agree to the opening up of negotiations on the question of adjustment of the wage rates of timeworkers, etc. After the conference, Mr. T. D. Buttercase, for the employers, and Mr. Arthur Shaw, for the operatives, informed the Press that the meeting had been adjourned, and that they had nothing further to report. It was further stated that the date of the adjourned meeting was in dispute, but negotiations had not broken down.

From Week to Week

SIR ALEXANDER JAMES ANDERSON, K.T., C.S.I., has been elected a director of the Rio Tinto Co.

IN THE SILK AND ARTIFICIAL SILK trades in Great Britain, at March 21, 1,490 insured men and 2,292 insured women were recorded as unemployed, according to a statement made by Mr. Betterton in the House of Commons.

UNIVERSITY NEWS: Mr. T. G. Bedford (Sidney Sussex), Dr. F. G. Mann (Downing), and Mr. E. G. Dymond (St. John's) have been appointed members of the faculty of physics and chemistry of the University of Cambridge.

ACCIDENTAL DEATH WAS THE VERDICT recorded at the inquest at Bradford, on Thursday, April 14, on John Henry Jackson, aged 22, a chemical student of Bridle Stile, near Halifax, who was fatally injured in a motor accident on the previous Sunday.

INTERNATIONAL COMBUSTION, LTD., in the course of a letter to the General Purposes Committee of the Barrow Corporation, stated that for business reasons they were removing their works from Barrow to Derby, where they are already established.

A DEPUTATION FROM I.C.I., which includes Sir Alfred Mond and Sir Henry MacGowan, is now making a tour of investigation in Germany. Last week the deputation paid a brief visit to Berlin, and then returned to the Rhineland. The deputation has already inspected the Leuna Nitrogen Works.

ALLEGED TO HAVE BROKEN and entered the offices of the Viaduct Alum Works, Widnes, on the night of April 14–15, and to have stolen stamps, including insurance stamps, to the value of £1 11s., Joseph Carter, aged 40, was remanded at Widnes Police Court on Thursday, April 21. He stated that he bought the stamps from another person.

RECENT WILLS INCLUDE: Dr. Arthur William Crossley, D.Sc., F.R.S., C.M.G., C.B.E., LL.D., of Thorngrove, Alderley Edge, Cheshire, formerly of the Shirley Institute, Didsbury, Manchester, late director of the British Cotton Industry Research Association, and at one time Daniel Professor of Chemistry at King's College, London, £26,432 (net personalty £25,247).

SIR HENRY A. MIERS, F.R.S., will deliver the May lecture of the Institute of Metals on Wednesday, May 11, at 8 p.m., at the Institution of Mechanical Engineers, Storey's Gate, Westminster, London, S.W.1, his subject being "The Growth of Crystals in Supersaturated Liquids." Cards of invitation may be obtained by non-members on application to the secretary of the institute.

THE SHIP CANAL PORTLAND CEMENT MANUFACTURERS, LTD., of Ellesmere Port, have issued a circular to the shareholders stating that negotiations have been concluded whereby the company have acquired, in conjunction with certain other important interests, the business of one of the best cement manufacturers in the country. The acquisition will not entail any addition to the issued capital of the company.

SIR MAX MUSPRATT, of I.C.I., and Mr. W. J. U. Woolcock, of the Association of British Chemical Manufacturers, are among the representatives of the Federation of British Industries who are meeting representatives of the Conféderation Générale de la Production Française in Paris, the meeting being a return one following on the one recently held in London. Following this meeting, Sir Max Muspratt will proceed to Geneva for the economic conference of the League of Nations, which opens on May 4.

A STATUE of the Comte de Chardonnet, the French chemist who invented one of the first processes for the manufacture of artificial silk, is to be erected by the Academy of Science and Art at Besancon. He worked at the perfection of the processes for the greater part of his life, and his first experiments were made in a laboratory on his estate, where he built the first machine for weaving the material. This machine was exhibited in Paris in 1889, when for the first time the actual manufacture of artificial silk was witnessed.

AN INQUIRY INTO THE DEATH OF Patrick Mulroy, a chemical process worker, employed on the acetic anhydride plant at Sullivan's works of the United Alkali Co., was opened at Widnes on Tuesday, April 19. It was stated during the proceedings that the deceased, who died on Thursday, April 14, had several times during his five months employment at the works complained of being affected by gas. The inquest was adjourned *sine die* to allow an examination for gas poisoning to be made of certain organs of the body.

APPLICATIONS ARE INVITED for the following appointments: A Ramsay Memorial Fellowship for Chemical Research, £250 plus £50 for expenses. The Secretary, Ramsay Memorial Fellowship Trust, University College, Gower Street, London. June 6.—Demonstrator (man or woman) in the Chemical Department of Bedford College for Women (University of London), Regent's Park, N.W.1. £250-£300. The Secretary. May 7.—Gas Examiners (part-time). The Clerk of the L.C.C., The County Hall, Westminster Bridge, S.E.1. May 9.—Fellowships (Salters' Institute of Industrial Chemistry) for chemists of post-graduate standing. £250 to £300 or higher. The Director, Salters' Institute of Industrial Chemistry, Salters' Hall, St. Swithin's Lane, E.C.4. June 1.

PROFESSORS W. NERNST, W. Ostwald and R. Willstatter have been elected honorary members of the American Chemical Society.

PROFESSOR R. WILLSTATTER was elected by ballot as an honorary fellow of the Chemical Society of London at a meeting held recently.

MR. AND MRS. ROBERT MOND have returned to 9, Cavendish Square from the Continent and will remain in London for the season.

THE PURE BONE PHOSPHATE AND CHEMICAL CO., LTD., inform us that as from March 25 the registered office of the company has been Beacon Hill, Newark (T.N. 109).

DR. W. R. CHAPMAN, of the Department of Fuel Technology, Sheffield University, has joined the technical staff of Sensible Heat Distillation, Ltd., and "L. and N." Coal Distillation, Ltd.

CHEMICAL FELLOWSHIPS averaging $2,500 have been awarded by the John Simon Guggenheim Memorial Foundation of America to Drs. R. Bradfield, G. E. Gibson, F. C. Hoyt, L. H. Ryerson, and G. W. Woodrow.

THE FARADAY LECTURE of the Chemical Society will be delivered by Professor Willstätter at the Royal Institution, London, on Wednesday, May 18. The subject will be: "Problems and Methods in Enzyme Research."

MR. AMERY, the Colonial Secretary, in the House of Commons on Tuesday, informed Colonel Wedgwood that negotiations for the conclusion of an agreement for the working of a concession for the development of the Dead Sea salt deposits were in progress, and he hoped to be able to make a statement shortly.

A SERIES OF LECTURES and counter-lectures will again be given this year, during May and June, in aid of the King Edward Hospital Fund for London, at the London School of Economics. The subject of the first, on Tuesday, May 10, at 5.30 p.m., will be "Are Capitalists Overpaid?" The speakers will be Sir Ernest Benn, C.B.E., and Mr. James Maxton, M.P., and the chair will be taken by the Rt. Hon. T. P. O'Connor, M.P.

A SUBSTITUTE FOR INSULIN, called "Horment," was described at the Berlin Congress of Surgeons recently. The preparation is the discovery of Professor von Noorden, of Frankfort, a leading authority on metabolism. It is stated that after exhaustive experiments on animals, from which the pancreas had been removed and in which "Horment" completely counteracted the formation of sugar, it was used with complete success in the treatment of human patients.

THE UNITED STATES PATENT ACTS have been revised. Special attention may be directed to the amendment of Section 4,934 of the Revised Statutes which prescribes new rates for patent fees, and to the amendment of Section 4,900 of the Revised Statutes which prescribes an alteration in the form of the marking of patented articles as a notice to the public. Copies of the amending Acts may be consulted in the Public Library of the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.2.

A SWEDISH CHEMIST, E. L. Rinman, claims to have developed a method of manufacturing alumina from silicious materials, particularly clay. The raw material is decomposed with sulphuric acid, and ammonia alum is produced by adding ammonium sulphate. The alum is treated with ammonia under such conditions that alumina is precipitated in a convenient form and practically free from sulphuric acid. The solution of ammonium sulphate after the excess of ammonia has been expelled, is partly used again for the formation of alum and partly treated with lime to recover the ammonia. This last named process also may be carried out by aid of a silicate of lime, for instance, Portland cement. Pure alumina can also be produced by treating the solution of aluminum sulphate—obtained by the decomposition of the raw material with sulphuric acid—with a solution of sodium hydrosulphide by which an impure precipitate of alumina is formed. This is dissolved in a solution of sodium sulphide and, after filtration, is precipitated again in pure state by treating with hydrogen sulphide.

Obituary

MR. W. T. COOK, of Cardiff, aged 22, on Tuesday, April 19, as the result of injuries received in a motor accident.

SIR JOHN WESTERMAN CAWSTON, until 1921 Deputy Master and Comptroller of the Royal Mint, on April 21, at Felixstowe. He was appointed to the Mint in 1917.

DR. SIEGMUND NEUMANN, in Hungary, recently, aged 66. He was well known in chemical and industrial circles in Hungary, and was instrumental in founding the "Verein Ungarischer Chemiker" (Union of Hungarian Chemists) in 1907.

DR. J. B. READMAN, at Bradford-on-Avon. He was educated at Glasgow Academy, and, specialising in chemistry, was sent to New Caledonia to investigate its nickel deposits. Returning to Scotland, he established works to carry out a process of extracting nickel from the ore, and sold the concern to a French company. He then took the science degree at Edinburgh University, and set himself to simplify certain processes, especially the production of phosphorus and other substances. He adapted the electric furnace to the manufacture of cyanide from atmospheric nitrogen. He was a member of the Society of Chemical Industry.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

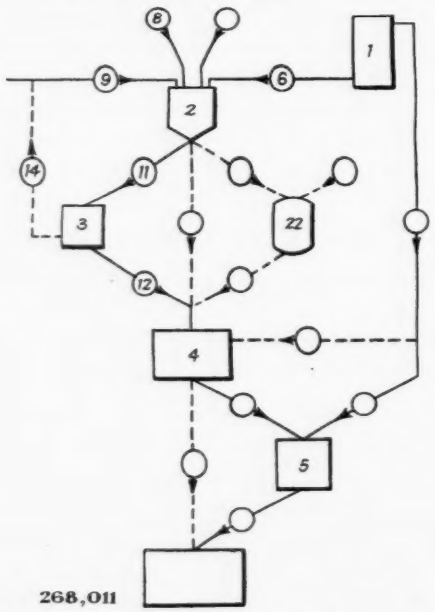
Abstracts of Complete Specifications

268,006. Oxidation of Coal, Process for. W. A. Bone, Montrose, Harpenden Road, St. Albans, R. Quarendon, 72A, Oakmead Road, Balham, London, S.W.12, and The Gas Light and Coke Co., Horseferry Road, London, S.W.1. Application date, December 14, 1925.

When coal is treated with an alkaline solution of an alkaline manganate or permanganate, the chief constituents of the product are benzenoid carboxylic acids. Brown coal, lignite, or bituminous coal may be oxidised, but in the last case the coal is preferably previously extracted by a volatile solvent such as benzene under pressure to remove neutral oils and other substances which cause coking. Alkaline potassium permanganate is preferably used, the chief product being a potassium salt of mellitic acid. In the case of brown coal a solution containing 10 per cent. of potassium permanganate and 1 per cent. of potassium hydroxide is used at boiling point at atmospheric pressure, but in the case of bituminous coal or its residue the solution is employed in an autoclave under pressure. In an example of the treatment of brown coal or lignite, the reaction is effected in a reflux apparatus, and the product then filtered hot to separate hydrated manganese oxides. The filtrate is concentrated, and the equivalent quantity of dilute sulphuric acid added. Carbon dioxide is evolved and potassium sulphate crystallised. The liquor is then steam-distilled to remove acetic acid, and evaporated to dryness. The residue is extracted with ether which dissolves the carboxylic acids consisting chiefly of mellitic acid. The yield is 40–50 per cent. of the original coal. Examples are also given of the treatment of bituminous coal.

268,011. Silicious Alkaline Earth Compounds, Manufacture of. A. J. H. Haddan, London. From The Celite Co., Van Nuys Building, Los Angeles, Cal., U.S.A. Application date, December 18, 1925.

When finely ground or pulverised silica is treated with lime or other alkaline earth, in the presence of water, a rapid



268,011

reaction takes place yielding a voluminous mass of hydrated silicate which may be dried and pulverised or calcined. Thus if diatomaceous earth is heated with calcium hydroxide in the presence of water a product is obtained which is more than 10 times the volume of the original material. This product is a very efficient filtering material which may be employed for the filtration of industrial liquors such as sewage, oils, fruit juices, beet and cane sugar liquids, syrups, etc. Thus a raw sugar solution containing 60 per cent. of sugar by weight at 80° C. can be filtered 3·3 times as quickly as with pure diatomaceous earth, while the bleaching effect is greater. The product may also be used as an absorbing material, as a filler, or as a heat insulator. The proportion of lime employed is 25–100 per cent. and the temperature is preferably 90°–110° C. If the compound of silica and alkaline earth is calcined while still wet, the product consists of particles 0·001 mm. in size.

Limestone is calcined in a kiln 1, and the burned lime ground in an apparatus 6 and then conveyed to a tank 2. Powdered silicious material is supplied from 8 and cold or hot water from 9. The product passes through a pipe 11 to vacuum filters or settlers 3 from which the liquid is discharged from a pipe 14 while the solids pass through a pipe 12 to a calciner 4. Alternatively, the products from the tank 2 may pass directly to the calciner 4. In another alternative, the mixture may pass from the tank 2 to an autoclave 22 where the reaction may be effected at higher temperature and pressure, the product then passing to the calciner 4. The calcined material passes to a chamber 5 where it is treated with gases containing carbon dioxide in the kiln 1. Or alternatively, the carbon dioxide may pass to the calciner 4, so that the calcining and carbonating operations take place simultaneously. The calcination is effected at 500°–1000° C., but if the temperature is below 800° C. any excess of lime forms calcium carbonate so that the final product is a mixture of calcium meta-silicate and calcium carbonate. The product can be used as a filler in paints, dental powders and pastes, soaps, polishes, etc., as a carrier for catalysts such as nickel, as an absorbent for gases and liquids, as a filler for rubber, and as a constituent for hydraulic cements.

268,024. Recovering Sulphur Compounds of Ammonia in the Form of Salts from Gas Mixtures containing Sulphuretted Hydrogen and Ammonia. F. Siemens Akt.-Ges., 15, Schiffbauerdamm, Berlin, and H. Bähr, 24, Dernburgstrasse, Charlottenburg, Berlin. Application date, December 23, 1925.

The gas mixture is treated at a temperature of 300° C. with a catalyst consisting of at least two metals, one being iron, nickel, or copper, which binds the sulphur, and the other tungsten, vanadium, or chromium, which takes up oxygen from the gas and transfers it to the sulphur, forming sulphur dioxide and trioxide, which react with the ammonia to form sulphites, bisulphites, and or sulphates. This process can be used where the percentage of sulphuretted hydrogen is very small, and the low temperatures employed are not sufficient to oxidise other combustible gases. Further, the sulphuretted hydrogen is oxidised without any surplus of air. The metal catalyst may be combined to form an alloy which may be in the form of wire or netting. The wire may be heated electrically when it is necessary to heat the gas. The known resistance wire consisting of iron, nickel, and chromium forms a suitable catalyst. If the catalyst is heated electrically, it may be purified from tarry deposits by slightly increasing the temperature. The ammonia salts may be removed from the gases by electrical precipitation.

268,104. Lead Nitrate, Process of manufacture of. W. H. Bentley, "Lynton," Hapton, Burnley, Lancs, B. Catlow, 68, Rhyddings Street, Oswaldtwistle, Lancs, and William Blythe and Co., Ltd., Holland Bank Chemical Works, Church, Lancs. Application date, February 24, 1926.

In the manufacture of lead nitrate by treating lead with nitric acid, oxides of nitrogen are evolved some of which may be recovered by absorbing in water, but some nitric acid is always lost. In this process, loss of nitric acid is avoided by making use of two known facts: (1) metallic lead is superficially oxidised on exposure to air, (2) the oxide formed may be

dissolved with a solution of lead nitrate. In this process, lead is exposed to air in the presence of lead nitrate solution, and nitric acid is added to the liquor in an amount equal to the lead dissolved. An indefinite quantity of normal nitrate solution may thus be obtained by using a limited quantity of lead nitrate solution as a medium for converting the lead into lead nitrate. The reaction can be effected at ordinary or slightly raised temperatures so that steam heating is unnecessary. The lead may be in granulated form contained in an acid-proof basket which is alternately exposed to the air and lowered into the lead nitrate solution. When the solution is found to be basic, nitric acid is added until it becomes slightly basic or neutral.

268,158. VANILLIN, SEPARATION AND PURIFICATION OF. J. Tcherniac, 49, Palace Road, Streatham Hill, London, S.W.2. Application date, April 27, 1926.

The purification of vanillin in the form of sodium bisulphite compound is difficult owing to the great solubility of this compound in water which renders recrystallisation difficult. In this invention, the sodium bisulphite compound is rendered less soluble by saturating with sodium chloride. Alternatively, the solution may be treated to displace the sodium by potassium by adding potassium chloride in equivalent quantity. The vanillin-potassium-bisulphite is less soluble and crystallises out, or the vanillin-sodium-bisulphite if sodium chloride has been used for salting out. Vanillin is obtained from the double salt by treating with acid.

268,181. SODIUM CHLORIDE, MANUFACTURE OF. A.P.I.C.E. Societa Anonima Prodotti Italiani Chimici Estrattivi, and O. Gasparrini, 22, Via Palma, Rome. Application date, June 1, 1926.

Commercial sodium chloride usually contains calcium and magnesium chlorides which are deliquescent and cause the salt to become damp. In this process, the dampness is prevented on adding alkali carbonate or bicarbonate in sufficient quantity to convert the magnesium and calcium chlorides into carbonates. The reagent is added in dilute solution so that it may be uniformly distributed. Reference is directed in pursuance of Section 7, Sub-section 4, of the Patents and Designs Acts of 1907 and 1919 to Specification No. 15589/1900.

268,219. PRESERVING LATEX, METHOD OF. General Rubber Co., 1790, Broadway, New York. Assignees of A. E. Jury, 290, Orient Way, Rutherford, N.J., U.S.A., and O. H. Smith, 561, West 58th Street, New York. International Convention date, June 8, 1926.

Latex is preserved by adding an organic antiseptic such as formaldehyde, and an alkaline phosphate such as trisodium phosphate. The hydrogen ion concentration of the latex is reduced to a point below 1×10^{-7} by the addition of sufficient trisodium phosphate, and at the same time sufficient formaldehyde is added to prevent bacterial action. The quantity of the expensive formaldehyde required is thus reduced to a minimum. Other antiseptics may be used, such as phenol, cresol, resorcinol, and hexylresorcinol. The quantities required vary from 0·1 to 0·5 per cent. of formaldehyde, and 0·0042 to 1·5 per cent. of trisodium phosphate, according to the time for which the latex is to be preserved. By this process, the free formic acid present in commercial formaldehyde is neutralised and coagulation due to its presence is prevented.

NOTE.—Abstract of the following specification which is now accepted, appeared in THE CHEMICAL AGE when it became open to inspection under the International Convention: 245,152 (Deutsche Gold- und Silber Scheideanstalt vorm. Roessler), relating to production of concentrated solutions of alkali cyanides, see Vol. XIV, p. 234.

International Specifications not yet Accepted

266,004. BY-PRODUCT RECOVERY IN COKE OVEN OR LIKE PLANTS. C. Still, 4, Bismarckplatz, Recklinghausen, Germany. (Assignees of A. Weindel, Essen, Germany.) International Convention date, February 15, 1926.

The aqueous portion of the condensate obtained in cooling the hot distillates is treated to remove phenol, which is in greater concentration than in the crude ammoniacal liquor containing also the liquor from the gas washers. The condensates may be treated with solvent naphtha or a high boiling tar oil, and may be clarified by filtration, adsorption with coal dust, or by allowing the mixture to stand before treatment.

266,300. CELLULOSE ESTERS. Soc. Lyonnaise de Soie Artificielle, 20, Rue Lafont, Lyons, and P. Chevalet, Lux, Côte d'Or, France. International Convention date, February 22, 1926.

To obtain a partly esterified hydrocellulose suitable for the manufacture of artificial threads, films, and plastics, cellulose is treated with formic acid and a small proportion of sulphuric acid. The surplus liquid is squeezed out, and the mixture then treated with glacial acetic acid and a relatively large proportion of sulphuric acid. The cellulose derivative is precipitated by pouring into water or alcohol, and is soluble in formic acid, formaldehyde, pyridine, ureas, cyanates, thiocyanates, alkali and alkaline earth nitrates, and calcium chloride.

266,311. CONVERTING COAL INTO HYDROCARBONS. A. Gaertner, Ludwigsdorf, Silesia, Germany. International Convention date, February 18, 1926.

Powdered coal and finely divided iron are injected into a reaction chamber together with steam. Hydrogen is obtained from the steam and iron, and reacts with the coal at 25–30 atmospheres and 400° C. Any carbon dioxide formed may be absorbed by lime, and hydrocarbons are obtained. The reaction chamber may be of catalytic material such as nickel.

266,313. BASE-EXCHANGING SUBSTANCES. A. Rosenheim, 3, Carmerstrasse, Charlottenburg, Berlin. International Convention date, February 16, 1926.

Minerals containing iron oxide, alumina, or insoluble silicates, such as thuringite, chamoisite, leucite, brown iron ore, bog ore, or bauxite, are treated with silicic acid, with or without alkalis, aluminates, or phosphates. The temperature may be raised, and the pressure may be above or below atmospheric, and the mineral may be hydrated by treating with hot water or steam. The mineral may be mixed with a silicate solution such as waterglass, or a solution of a metasilicate, which may be enriched with silicic acid. The base-exchanging substance obtained may be the result of chemical change or mechanical surface modification.

266,346. SYNTHETIC DRUGS. Chemische Fabrik auf Actien (vorm. E. Schering), 170, Mullerstrasse, Berlin. International Convention date, February 17, 1926.

Aliphatic auromercapto-carboxylic acids are obtained by treating an aliphatic mercapto-carboxylic acid with an auric salt in the presence of sulphurous acid. The auro compounds of thiolactic acid and cystein, with potassium auribromide, are described.

266,358. SYNTHETIC RESINS. P. Haller, 37, Freiestrasse, Berne, and H. Kappeler, 50, Rütlistrasse, Basle, Switzerland. International Convention date, February 17, 1926.

A mixture of aniline and hydrochloric or acetic acid or potassium bisulphate is treated with formaldehyde, and the product washed and treated with caustic soda, sodium carbonate, alkali sulphite, ammonia, or caustic lime. The temperature of condensation should be below 100° C. The aniline may be mixed with toluidine or naphthylamine, or aniline hydrochloride may be condensed with formaldehyde; or aniline may be treated with formaldehyde in presence of an alkaline substance, the product treated with hydrochloric or hydrofluoric acid, and finally with alkali. The products may be modified by the addition of water, glycerine, urea, or tannin, and fillers may also be added. The products are substitutes for bone, horn, etc., and are insulating materials.

266,378. UREA. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, February 19, 1926.

A solution of urea of 50–90 per cent. strength is broken up into drops by sprayers, nozzles, or rotary discs, and admitted to the top of a tower 20 metres high, so that it passes downwards against a current of air or gas. Warm air may be admitted at the upper end, and cold air at the lower end, so that cooling of the drops is complete at the bottom. The air may be admitted tangentially to increase the time of falling. The product is in the form of a crystal pulp which is dried to obtain needle-shaped crystals.

266,382. DYES. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, February 20, 1926.

An α-derivative of isatin or a homologue or substitution

product is condensed with a 3-oxy-1-thionaphthene trisubstituted in the 4-, 6-, and 7-positions by three halogen atoms or one alkyl group and two halogen atoms, or two alkyl groups and one halogen atom to obtain 2-thionaphthene-2¹-indolindigo dyes. The oxythionaphthene derivatives can be obtained from 1-amino-benzenes substituted in the 2- and 5-positions by halogen or alkyl, or from the corresponding trisubstituted anilines such as 1-amino-2-methyl-3 : 5-dichlorobenzene by replacing the amino group by the thioglycollic acid group and effecting ring closure. Examples are given.

LATEST NOTIFICATIONS.

269,118. Apparatus for continuously expelling the sulphurous acid from mixtures of sulphurous acid and oil. Allgemeine Ges. für Chemische Industrie. April 12, 1926.

269,128. Treatment of cellulose derivatives. Clavel, R. April 6, 1926.

269,133. Process of obtaining nickel or ferro-nickel. Stern, M. April 7, 1926.

269,135. Non-corrosive alcohol composition. U.S. Industrial Alcohol Co. April 6, 1926.

269,146. Method of spot-dyeing yarn and an extracting device for use therewith. Eclipse Textile Devices, Inc. April 8, 1926.

269,147. Method and apparatus for dyeing yarn. Eclipse Textile Devices, Inc. April 8, 1926.

269,155. Manufacture of substituted aromatic sulphonic acids. I.G. Farbenindustrie Akt.-Ges. April 7, 1926.

269,163. Internal-combustion engines operated with pulverulent fuels. I.G. Farbenindustrie Akt.-Ges. April 8, 1926.

269,164. Process for the precipitation of heavy metals from ammoniacal solutions. I.G. Farbenindustrie Akt.-Ges. April 9, 1926.

269,166. Catalytic production of hydrocyanic acid from formamide. I.G. Farbenindustrie Akt.-Ges. April 10, 1926.

269,171. Internal-combustion engines operated with pulverulent fuels. I.G. Farbenindustrie Akt.-Ges. April 12, 1926.

269,174. Method of dissolving aluminiferous raw materials by means of sulphuric acid or acid sulphates. Jacobsson, R. April 6, 1926.

269,195. Treatment of yarn packages with liquids and products obtained thereby. British Celanese, Ltd. April 12, 1926.

269,199. Manufacture of phosphatic fertilisers. Préparation Industrielle des Combustibles, and Hoffmann, A. April 8, 1926.

269,209. Process of transforming pulverulent substances into uniform small pieces for reaction with gases. I.G. Farbenindustrie Akt.-Ges. April 10, 1926.

269,212. Manufacture of diazo-salts and of preparations therefrom. I.G. Farbenindustrie Akt.-Ges. January 19, 1925.

Specifications Accepted with Date of Application

241,221. Gas purification and regenerating sulphided alkaline solutions. Koppers Co. October 11, 1924.

244,456. Low temperature distillation of bituminous substances. Kohlenveredlung Ges. December 11, 1924.

245,716–7. Steel, Process for producing. C. H. Wills. January 10, 1925.

246,127. Converting into soluble form insoluble condensation products of urea or a derivative thereof and formaldehyde. Soc. of Chemical Industry in Basle. January 17, 1925.

254,676. Continuous purification of crude carbon disulphide, Process for. E. Legeler and P. Esselmann. July 6, 1925. Addition to 238,489.

254,701. Permanent emulsions, Process for the production of. P. Lechler. July 1, 1925.

255,103. Aluminium alloys having a high silicon content, Process for the production of. T. Goldschmidt Akt.-Ges. July 10, 1925.

255,411. Distillation of coal at low temperatures. Campagnie des Mines de Vicoigne, Noeux, et Drocourt. July 17, 1925.

256,225. Alkyl and aralkyl resorcinols, Process for the production of. H. Hirzel. July 30, 1925.

268,278. Antimonial ores, especially tin ores containing antimony, Method of treating. Zinnwerke Wilhelmsburg Ges. March 29, 1926.

268,537. Dyestuffs. W. G. Woodcock, H. A. E. Drescher, E. G. Beckett, J. Thomas, and Scottish Dyes, Ltd. October 3, 1925.

268,845. Acetic acid, Manufacture of. H. Dreyfus. November 7, 1925.

268,877. Arylides of orthohydroxy-carboxylic acids, and intermediate products suitable for the manufacture of azo-dyestuffs, Manufacture of. British Synthetics, Ltd., and E. B. Higgins. January 7, 1926.

268,890. Alkyl formates, Manufacture and production of. J. Y. Johnson (*I. G. Farbenindustrie Akt.-Ges.*) January 11, 1926.

268,891. Anthraquinone intermediates, Manufacture and production of. British Dyestuffs Corporation, Ltd., and W. W. Tatum. January 11, 1926.

268,980. Soft soaps, Process for the manufacture of. L. G. Leffer and Naamlooze Vennootschap Internationale Zeep-Co. May 3, 1926.

268,998. Electrolysis of water, Apparatus for. L. Casale. June 1, 1926.

269,012. Esterification of cellulose. Courtaulds, Ltd., and C. Diamond. June 21, 1926.

269,028. Chromic chloride, Manufacture and production of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) July 26, 1926.

269,037. Hardening phenol-aldehyde condensation products under heat and pressure, Method of. G. M. Hick and N. G. Hick. August 12, 1926.

269,046. Ozonising air and converting it into nitric oxide, Apparatus for. A. Negle. August 30, 1926.

269,052. Separating by vacuum distillation the most volatile constituent of a mixture of liquids, Process of separating. A. Schmalenbach. June 9, 1926. Addition to 244,736.

269,090. Fractional distillation. Thermal Industrial and Chemical (T.I.C.) Research Co., Ltd., and W. J. Chadder. November 23, 1926.

Applications for Patents

Achille Serre, Ltd., Alliott, E. A., Hammond, C. F., and Hatfield, A. E. Dyeing or washing fabrics, etc. 10,168. April 13.

British Celanese, Ltd. Products obtained with cellulose derivatives, 10,341. April 14. (United States, May 21, 1926.)

British Celanese, Ltd., Ellis, G. H., and Mann, R. J. Treatment of cellulose derivatives. 10,342. April 14.

British Dyestuffs Corporation, Ltd., Evans, F. P., Hailwood, A. J., Harrison, A. A., and Jackson, H. Manufacture of dry preparations of pigment dyes. 9,959. April 11.

British Dyestuffs Corporation, Ltd., Hailwood, A. J., and Shepherdson, A. Preparation of finely divided solids. 9,960. April 11.

British Dyestuffs Corporation, Ltd., and Hailwood, A. J. Manufacture of N-diarylsulphonyl derivatives of arylaminesulphonic acids. 10,090. April 12.

Carpmael, W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of chromium oxide, etc. 10,070. April 12.

Carpmael, W. Manufacture of alkali nitrates. 10,071. April 12.

Coley, H. E. Manufacture of zinc. 10,044, 10,045. April 12.

Dreaper, W. P. Manufacture of cellulose acetate, etc. 10,285. April 14.

Etablissements Poulenc Frères. Manufacture of organic salts of c-c-dialkyl and arylalkyl barbituric acids. 10,322. April 14. (France, May 25, 1926.)

I.G. Farbenindustrie Akt.-Ges. and Mond, A. L. Separating phosphorus from phosphorus-containing gases. 9,891. April 11.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Preparation of ferric oxide purifiers for gases. 9,904. April 11.

I.G. Farbenindustrie Akt.-Ges. and Imray, O. Y. Manufacture of anthrahydroquinone derivatives. 10,190. April 13.

I.G. Farbenindustrie Akt.-Ges. Transforming pulverulent substances into small pieces. 9,890. April 11. (Germany, April 10, 1926.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of diazo salts, etc. 9,922. April 11. (Germany, January 19, 1925.)

I.G. Farbenindustrie Akt.-Ges. Recovery of sulphur. 10,039. April 12. (Germany, April 16, 1926.)

I.G. Farbenindustrie Akt.-Ges. Production of unsaturated gaseous hydrocarbons, etc. 10,040. April 12. (Germany, April 15, 1926.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of diazosulphamic acids of cyclic series. 10,318 April 14. (Germany, April 15, 1926.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of compounds of aromatic para-diamines with sulphur dioxide. 10,319. April 14. (Germany, April 17, 1926.)

Nobel's Explosives Co., Ltd., and Paterson, T. R. Cellulose derivatives. 10,079. April 12.

Parrish, P., Snelling, F. C., and South Metropolitan Gas Co. Installations for recovering ammonia from ammoniacal liquor. 10,191. April 13.

Rubber Service Laboratories Co. Manufacture of acetaldehyde. 10,085. April 12. (United States, April 12, 1926.)

Salerni, P. M. Distillation of carbonaceous materials. 10,064. April 12.

Salerni, P. M. Means for destroying micro-organisms. 10,365. April 14.

Singer, R. Production of cellulose varnishes. 9,903. April 11.

Soc. Chimique des Usines du Rhône. Process for colouring cellulose esters, etc. 10,088. April 12.

Soc. Chimique des Usines du Rhône. Manufacture of powdered plastic material. 10,089. April 12. (France, August 3, 1926.)

Wilson, W. C. Cellulose derivatives. 10,079. April 12.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton for home market, 1-cwt. drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—9½d. per lb. Crude 60's, 2s. 6d. to 2s. 8d. per gall.

ACID CRESYLIC 99/100.—2s. 6d. to 2s. 8d. per gall. Steady. 97/99.—2s. 1½d. to 2s. 3d. per gall. Pale, 95%, 2s. to 2s. 1½d. per gall. Dark, 1s. 9d. to 1s. 10d. per gall.

ANTHRACENE.—A quality, 2½d. to 3d. per unit. 40%, 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.

BENZOLE.—Crude 65's, 1s. 0¾d. to 1s. 1¾d. per gall., ex works in tank wagons. Standard Motor, 1s. 9d. to 2s. 2d. per gall., ex works in tank wagons. Pure, 1s. 11d. to 2s. per gall., ex works in tank wagons.

TOLUOLE.—90%, 1s. 10d. to 1s. 11d. per gall. Firm. Pure, 1s. 11d. to 2s. per gall.

XYLOL.—2s. per gall. Pure, 3s. per gall.

CREOSOTE.—Cresylic, 20/24%, 10½d. per gall. Standard specification, 6¾d. to 9d.; middle oil, 7½d. to 8d. per gall. Heavy, 8¾d. to 9d. per gall. Salty, 7d. per gall. less 1½%.

NAPHTHA.—Crude, 8d. to 9d. per gall. according to quality. Solvent 90/160, 1s. 10d. to 1s. 11d. per gall. Solvent 95/160, 1s. 6d. to 1s. 7d. per gall. Solvent 90/190, 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £8 per ton. Whizzed or hot pressed, £8 10s. to £9 per ton.

NAPHTHALENE.—Crystals, £11 10s. to £13 10s. per ton. Quiet. Flaked, £12 10s. per ton, according to districts.

PITCH.—Medium soft, 75s. to 80s. per ton, according to district; nominal.

PYRIDINE.—90/140, 8s. 6d. to 9s. per gall. Nominal. 90/180, 5s. per gall. Heavy, 5s. to 8s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—4s. 9d. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—1s. 6d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—7d. per lb. naked at works.

ANILINE SALTS.—7d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—4d. per lb. Fair inquiry.

m-CRESOL 98/100%.—2s. 8¾d. per lb. Only limited inquiry.

p-CRESOL 32/34° C.—2s. 8¾d. per lb. Only limited inquiry.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb. d/d.

R. SALT.—2s. 2d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—7½d. to 8d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 5s. per ton. Grey, £15 10s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£6 15s. to £10 per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 1s. per gall. 16° Tw.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—4s. to 4s. 3d. per gall., 60% O.P. Solvent, 4s. 3d. per gall., 40% O.P.

WOOD TAR.—£4 to £5 10s. per ton and upwards, according to grade.

BROWN SUGAR OF LEAD.—£40 10s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.
ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 6d. per lb. Firm and brisk.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. per oz.; 500 oz. lots, 1s. per oz.
ACID, BORIC B.P.—Crystal, £41 per ton; powder, £45 per ton. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 5½d. to 1s. 6d. per lb., less 5%. Firm.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P.—1s. 4d. to 1s. 5d. per lb. Technical.—11¾d. to 1s. per lb. Both in good demand.
ACID, TANNIC B.P.—2s. 9d. to 2s. 11d. per lb.
ACID, TARTARIC.—1s. 2¾d. per lb., less 5%. Firm market.
AMIDOL.—9s. per lb., d/d.
ACETANILIDE.—1s. 6d. to 1s. 8d. per lb. for quantities.
AMIDOPYRIN.—8s 6d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: lump, 1s. per lb.; powder, 1s. 3d. per lb.
ATROPINE SULPHATE.—11s. per oz. for English make.
BARBITONE.—6s. 6d. per lb.
BENZONAPHTHOL.—3s. 3d per lb. spot.
BISMUTH CARBONATE.—9s. 9d. to 10s. per lb.
BISMUTH CITRATE.—9s. 6d. to 9s. 9d. per lb.
BISMUTH SALICYLATE.—8s. 9d. to 9s. per lb.
BISMUTH SUBNITRATE.—7s. 9d. to 8s. per lb.
BISMUTH NITRATE.—5s. 9d. to 6s. per lb.
BISMUTH OXIDE.—13s. 9d. to 14s. per lb.
BISMUTH SUBCHLORIDE.—11s. 9d. to 12s. per lb.
BISMUTH SUBGALLATE.—7s. 9d. to 8s. per lb. Extra and reduced prices for smaller and larger quantities respectively; Liquor Bismuthi B.P. in W. Qts. 1s. 1d. per lb.; 12 W. Qts. 1s. per lb.; 36 W. Qts. 11½d. per lb.
BORAX B.P.—Crystal, £24 per ton; powder, £25 per ton. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Potassium, 1s. 9½d. to 2s. per lb.; sodium, 2s. 0½d. to 2s. 2d. per lb.; ammonium, 2s. 2½d. to 2s. 4d. per lb., all spot.
CALCIUM LACTATE.—1s. 3½d. to 1s. 4½d.
CHLORAL HYDRATE.—3s. 2d. to 3s. 5d. per lb., duty paid.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHER METH.—1s. 1d. to 1s. 11½d. per lb., according to sp. gr. and quantity. Ether purif. (Aether B.P., 1914), 2s. 3d. to 2s. 4d., according to quantity.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—5s. per lb.
HEXAMINE.—2s. 4d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 5d. per gallon f.o.r. makers' works, naked.
HYDROQUINONE.—4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE B.P.—2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.
IRON PERCHLORIDE.—22s. per cwt., 112 lb. lots.
MAGNESIUM CARBONATE.—Light Commercial, £33 per ton net.
MAGNESIUM OXIDE.—Light commercial, £67 10s. per ton, less 2½%; Heavy Commercial, £22 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 18s. 3d. per lb. net; Synthetic, 11s. to 12s. per lb., according to quantity; 10s. 6d. for 1 cwt. lots and upwards; Liquid (95%), 12s. per lb.; Detached Cryst., 14s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10d. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 9d. per lb.
METHYL SULPHONAL.—11s. per lb.
METOL.—11s. per lb. British make.
PARAFORMALDEHYDE —1s. 9d per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. per lb.
PHENAZONE.—4s. 6d. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—97s. per cwt. less 2½% for ton lots.
POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb. for 1 cwt. lots.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 6d. per lb., spot.
QUININE SULPHATE.—2s. per oz., 1s. 8d. to 1s. 9d. for 1000 oz. lots in 100 oz. tins.
RESORCIN.—4s. per lb., spot.
SACCHARIN.—55s. per lb. Very limited inquiry.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.
SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923—2s. to 2s. 1d. per lb. for 1 cwt. lots. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 95s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 9d. to 1s. 10d. per lb. Crystal, 1s. 10d. to 1s. 11d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
SULPHONAL.—7s. 6d. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 11s. 6d. to 12s. per lb., according to quantity. Firmer. Natural, 14s. 9d. per lb. Cheaper.

Perfumery Chemicals

ACETOPHENONE.—7s. 3d. per lb.
AUBEPINE (EX ANETHOL), 10s. 6d. per lb.
AMYL ACETATE.—2s. per lb.
AMYL BUTYRATE.—5s. 3d. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 3d. per lb.
CINNAMIC ALDEHYDE NATURAL.—17s. per lb.
COUMARIN.—10s. 6d. per lb.
CITRONELLOL.—14s. 6d. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—10s. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. 6d. per lb.
GERANIOL (PALMAROSA).—17s. 6d. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—13s. 6d. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 18s. per lb. Ex Shui Oil, 14s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb.
METHYL BENZOATE.—4s. 6d. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—8s. 6d. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—10s. 6d. per lb.
PHENYL ETHYL ALCOHOL.—11s. per lb.
RHODINOL.—27s. 6d. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—18s. 6d. per lb. Good demand.

Essential Oils

ALMOND OIL.—10s. 3d. per lb.
ANISE OIL.—3s. 1d. per lb.
BERGAMOT OIL.—30s. per lb.
BOURBON GERANIUM OIL.—12s. per lb.
CAMPHOR OIL.—67s. 6d. per cwt.
CANANGA OIL, JAVA.—26s. per lb.
CINNAMON OIL LEAF.—6d. per oz.
CASSIA OIL, 80/85%.—8s. 6d. per lb.
CITRONELLA OIL.—Java, 85/90%, 2s. 1d. per lb. Ceylon, pure, 1s. 10d. per lb.
CLOVE OIL.—6s. per lb.
EUCALYPTUS OIL, 70/75%.—2s. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 21s. per lb.
LEMON OIL.—10s. per lb.
LEMONGRASS OIL.—4s. 6d. per lb.
ORANGE OIL, SWEET.—10s. 6d. per lb.
OTTO OF ROSE OIL.—Anatolian, 30s. per oz. Bulgarian, 70s. per oz.
PALMA ROSA OIL.—9s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 17s. 6d. per lb. Japanese, 8s. 3d. per lb.
PETITGRAIN OIL —7s. 9d. per lb.
SANDALWOOD OIL.—Mysore, 26s. 6d. per lb.; 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, April 27, 1927.

THE demand for chemicals this week has been distinctly brighter and there is a very fair volume of inquiry in the market. Prices continue steady all round and any price moves are usually in the upward direction. Export trade is also more active.

General Chemicals

ACETONE is firmer and the price is now about £60 to £62 10s. per ton, ex store, drums free.

ACID ACETIC.—There is no change in the price, and demand continues quite good on home trade account, but export is disappointing.

ACID CITRIC is a fair market and the price is 1s. 4d. per lb., less 5% for spot.

ACID FORMIC is very active, especially on export account; price unchanged.

ACID LACTIC is also firm and price continues unchanged, at £43 per ton for 50% by weight.

ACID OXALIC is moving steadily into consumption at last quoted figures.

ACID TARTARIC continues in fair request with price very firm at 1s. 2d. per lb.

ALUMINA SULPHATE continues quiet but price is well held at £6 2s. 6d. to £6 5s. per ton for 17/18%.

AMMONIUM CHLORIDE is in fair request and price is unchanged at about £19 per ton.

COPPER SULPHATE has been active and market continues very firm; business is passing at round about £25 per ton, less 5%.

CREAM OF TARTAR maintains its firm position and the price, if anything, is higher and is quoted at £95 to £96 per ton for B.P.

EPSOM SALTS.—Firm and unchanged at about £5 5s. per ton, f.o.r.

FORMALDEHYDE.—The demand for this product has sensibly improved and the value may be taken at from £41 to £43 per ton, according to quantity and position.

LEAD ACETATE continues active and price very firm at about £44 10s. per ton for White and £43 per ton Brown.

METHYL ACETONE has been active and price is firm at £60 per ton.

METHYL ALCOHOL.—Unchanged.

POTASSIUM CHLORATE is very firm and in good request at 3½d. per lb.

POTASSIUM PERMANGANATE is nominally unchanged and price is about 7¼d. to 7½d. per lb.

SODIUM ACETATE is somewhat easier at £18 10s. per ton.

SODIUM BICHROMATE.—Unchanged at British makers' figures.

SODIUM HYPOSULPHITE.—There has been more business reported for this product and Continental prices would appear to be advancing.

SODIUM PRUSSIATE.—Firm and scarce at 4½d. per lb.

SODIUM SULPHIDE.—A fair volume of business is reported by British makers at their own schedule figures, but there is still a fair amount of Continental competition at lower levels.

ZINC SULPHATE.—Firm and unchanged at £14 per ton.

Coal Tar Products

The market generally in coal tar products is quiet, with little change in prices from last week.

90's BENZOL is quoted at 1s. 7d. per gallon, on rails. The motor quality is plentiful, and can be bought at 1s. 6d. per gallon, on rails.

PURE BENZOL is quoted at 2s. per gallon, on rails.

CREOSOTE OIL is unchanged, and is worth from 7d. to 7¼d. per gallon, on rails in the North, while the price in London is from 8¼d. to 8¾d. per gallon, at works.

CRESYLIC ACID is firm, and the pale quality 97/99% is quoted at 2s. 2d. per gallon, on rails, while the dark quality 95/97% is worth about 2s. 1d. per gallon, on rails.

SOLVENT NAPHTHA is weak, and is worth about 1s. 2d. per gallon, on rails.

HEAVY NAPHTHA is in poor demand, and is quoted at 1s. 2d. per gallon, on rails.

NAPHTHALENES are unchanged, the 76/78 quality being quoted at £8 5s. to £8 15s. per ton, while the 74/76 quality is worth £7 10s. to £8 per ton.

PITCH is unchanged. To-day's value is 70s. to 80s. per ton, f.o.b. U.K. port.

Nitrogen Products

Export.—During the last week the sulphate of ammonia position has been unchanged. British producers continue quoting £10 15s. per ton f.o.b. U.K. port in single bags, and continental buyers are taking the quantities available at this price. On account of the sluggishness of the home demand, greater quantities are available for export than was anticipated. Consumption in Central Europe continues satisfactory.

Home.—The reports from the various parts of the country indicate that the home season is showing no signs of decline. Apparently the lateness of the season and the wet weather have postponed the placing of many orders and deliveries during end April and May will be larger than usual. Home prices remain unchanged.

Nitrate of Soda.—Stocks in Europe continue to be absorbed, but no impression has been made on the large stock piled up in Chile. There is considerable speculation about next season's prices, but their announcement will probably be delayed until towards the end of May. In the meantime low offers are appearing on the market for forward positions.

Calcium Cyanamide

THE present demand for this material chiefly concerns its use for root crops. The price for May is £9 16s. per ton for 4-ton lots, carriage paid to any railway station in Great Britain.

SUGAR BEET NEWS.—Mr. Guinness, Minister for Agriculture, replying in the House of Commons on Tuesday to Commander Bellairs, stated that the area under sugar beet in France and Great Britain in 1926 was 513,000 and 129,000 acres respectively. In 1927 it was estimated that the figure for this country would be over 200,000 acres. The financial assistance given to the British industry amounts, during the period of the highest rate of subsidy ending September 30, 1928, to 19s. 6d. per cwt. Excise duty amounting to 7s. 4⅝d. per cwt. was paid by the home manufacturer as compared with the Customs duty on foreign sugars of 11s. 8d. per cwt. The French producers were protected by a Customs duty on foreign sugars amounting to 6s. 10d. per cwt. On all sugars in France of home, colonial and foreign origin an internal consumption tax of 10s. 3d. per cwt. was levied.

American Sulphur and Pyrites Output

THE production of sulphur in the United States in 1926 amounted to 1,890,057 long tons, compared with 1,409,262 long tons in 1925, an increase of 34 per cent., according to the U.S.A. Bureau of Mines. The salient feature of the sulphur industry in 1926, however, was the record-breaking shipments, which totalled 2,072,687 tons, valued at approximately $37,300,000, compared with 1,858,003 tons, valued at approximately $29,000,000, in 1925, the previous record year. Production figures were second only to those of 1923 and, while still about 183,000 tons less than shipments, were closer than they had been since the closing down of the sulphur mine, Louisiana, in 1924. The price for sulphur was considerably higher in 1926 than in 1925.

Exports of sulphur or brimstone from the United States totalled 576,966 tons in 1926, valued at $10,918,580, of which 159,416 tons were exported to Canada, 108,477 tons to Germany, 91,735 tons to France, 66,507 tons to Australia, 27,340 tons to the United Kingdom, and 26,618 tons to New Zealand. Exports of refined, sublimed, and flowers of sulphur totalled 12,002,105 lb., valued at $236,146, exported mainly to Canada, Mexico, France, and Australia. In 1925 the exports of sulphur or brimstone amounted to 620,401 tons and the exports of refined, sublimed, and flowers of sulphur amounted to 6,381,791 lb. The exports in 1926 were second only to the record exports of 1925.

The output of pyrites in 1926 was practically at the same rate as in 1925, decreasing from 170,081 long tons, valued at $650,448, in 1925, to 166,559 tons, valued at $616,668, in 1926, or a decrease of 2 per cent. in quantity. The quantity sold or consumed by the producing company showed a larger decrease, from 170,298 long tons in 1925 to 163,217 tons in 1926. Imports of pyrites in 1926 showed an increase of 32 per cent. in quantity over 1925, from 276,385 tons, valued at $773,925, to 366,151 tons, valued at $856,981, and were the largest recorded since 1919. Of the total quantity imported, Spain furnished 365,103 tons and Canada the remainder.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, April 27, 1927.

THE heavy chemical market has been rather quiet during the past week, any inquiry going around being merely in connection with small business. Prices remain on about the same level as last reported, with the exception of carbolic acid, which shows a still further advance.

Industrial Chemicals

ACID ACETIC.—98/100%, £55 to £67 per ton, according to quantity and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton; powder, £36 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Still advancing, and price now about 9¼d. per lb., f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—British material quoted 1s. 5d. per lb., less 5%, f.o.b. U.K. ports. Continental offered at about the same figure c.i.f.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. 9d. per carboy. Dearsenicated quality, 6s. 3d. per carboy, ex works.

ACID NITRIC, 80°.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Unchanged at about 2⅞d. per lb., c.i.f. U.K. ports.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Spot material on offer at 1s. 2¼d. per lb., less 5%, ex store. Quoted 1s. 2¼d. per lb., less 5%, c.i.f. U.K. ports, prompt shipment.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material quoted £5 12s. 6d. per ton, ex store. On offer for early delivery at £5 5s. per ton, c.i.f. U.K. ports.

ALUM POTASH.—Lump quality quoted £8 per ton, c.i.f. U.K. ports. Crystal powder, 5s. per ton less. Lump on spot, £9 per ton. Crystal powder, £8 10s. per ton, ex store.

AMMONIA ANHYDROUS.—On offer at 9¾d. per lb., ex store. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers crystals of English manufacture unchanged at about £23 to £24 per ton, ex station. Continental on offer at about £20 10s. per ton, c.i.f. U.K. ports. Fine white crystals quoted £18 5s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Unchanged at about £18 per ton, ex wharf, prompt despatch from works. Spot material available at £19 5s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals on offer from the Continent at £7 12s. 6d. per ton, c.i.f. U.K. ports, packed in casks. Bags, 5s. per ton less. Spot material quoted £9 5s. per ton, ex store.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers £8 per ton ex station; minimum, 4-ton lots. Spot material, 10s. per ton extra. Continental now quoted £7 10s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacture, prices £5 to £5 5s. per ton, ex station. Continental on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports, for export.

COPPER SULPHATE.—Quoted £24 10s. per ton, f.o.b. U.K. ports, for export. Continental on offer at about £23 15s. per ton, ex wharf.

FORMALDEHYDE, 40%.—Now offered from the Continent at £38 per ton, c.i.f. U.K. ports. Spot material available at £39 10s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental now £2 17s. 6d. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £33 per ton, ex store.

LEAD, WHITE.—Quoted £33 5s. per ton, ex store.

LEAD ACETATE.—White crystals quoted £42 15s. per ton, c.i.f. U.K. ports; brown about £40 5s. per ton, c.i.f. U.K. ports; white crystals on spot quoted £44 5s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

MAGNESIUM CHLORIDE.—Quoted £6 6s. 6d. per ton, c.i.f. U.K. ports.

POTASH CAUSTIC, 88/92%.—Solid quality quoted £28 15s. per ton, c.i.f. U.K. ports; minimum, 15-ton lots. Under 15-ton lots, £29 10s. per ton. Liquid, £15 per ton; minimum, 15-ton lots. Under 15-ton lots, £15 7s. 6d. per ton, c.i.f. U.K. ports.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Now quoted £27 5s. per ton, ex wharf, early shipment. Spot material on offer at about £28 10s. per ton, ex store.

POTASSIUM CHLORATE.—Powdered quality on offer at £24 5s. per ton, c.i.f. U.K. ports. Spot material, £2 per ton extra.

POTASSIUM NITRATE.—Spot material on offer at £22 10s. per ton, ex store. Offered for prompt shipment from the Continent at about £21 per ton, c.i.f. U.K. ports.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 6½d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE (YELLOW).—In good demand and price unchanged at about 7½d. per lb., ex store, spot delivery. Offered from the Continent at 7¼d. per lb., c.i.f. U.K. ports.

SODA CAUSTIC.—Powder 98/99%, £19 7s. 6d. per ton; 76/77%, £15 10s. per ton; 70/72%, £14 10s. per ton, carriage paid station, minimum 4-ton lots on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—English material quoted £22 10s. per ton, ex store. Continental on offer at about £19 per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powder or pea quality, £1 7s. 6d. per ton more; alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 10s. per ton, ex station, minimum 4-ton lots. Continental on offer at about £8 2s. 6d. per ton, ex wharf, prompt shipment.

SODIUM NITRATE.—Ordinary quality quoted £13 per ton, ex store. Refined quality, 5s. per ton extra.

SODIUM NITRITE, 100%.—Spot material now quoted £20 5s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—Offered for prompt shipment from the Continent at 4¼d. per lb., ex wharf. Spot material on offer at 4½d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption, £3 7s. 6d. per ton, ex works.

SODIUM SULPHIDE.—60/65%, solid, £11 10s. per ton; broken, £12 10s. per ton; cakes, £12 10s. per ton; flake, £14 5s. per ton; crystals, 31/34%, £7 15s. to £8 10s. per ton, according to quality, delivered buyers' works, minimum 4-ton lots on contract. Prices for spot delivery are 5s. and 2s. 6d. per ton extra for solid and crystals respectively. Offered from the Continent at about £9 7s. 6d. per ton, c.i.f. U.K. ports; broken, 15s. per ton extra.

SULPHUR.—Flowers, £12 10s. per ton; roll, £11 10s. per ton; rock, £11 10s. per ton; floristella, £10 10s. per ton; ground American, £9 5s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—British material 98/100% quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100, solid, on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material on offer at about £10 10s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

BETA NAPHTHOL.—11d. to 1s. per lb. Some inquiries.

ALPHA NAPHTHYLAMINE.—1s. 3d. per lb. Some inquiries.

R. SALT.—2s. per lb. Small inquiries.

NAPHTHIONATE OF SODA.—1s. 8½d. per lb. Fair inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, April 28, 1927.

Business on the Manchester market during the past week has about got back to the pre-Easter standard, but there is plenty of room for improvement in most sections before it can be described as really satisfactory. For the most part the current demand is only of moderate extent, with the majority of the orders that are going through for early delivery. Export inquiry is of rather limited extent.

Heavy Chemicals

Alkali keeps quite steady at its recent level of £6 15s. per ton, and a steady business is reported. So far as bleaching powder is concerned, the demand for this is on a moderate scale, and values show no actual alteration at about £8 per ton, although foreign competition is keen. Phosphate of soda is in quiet request, and offers are being made at from £12 1s. 6d. to £12 15s. per ton. Bicarbonate of soda is moving off in fair quantities, and £10 10s. per ton is still being asked for this material. The demand for Glauber salts is relatively unsatisfactory, and at £3 2s. 6d. per ton values lack strength. Saltcake is unchanged on the week at about £3 12s. 6d. per ton, and a quiet business is being done. Sulphide of sodium continues in moderate demand, with 60–65 per cent. concentrated solid quoted at about £11 per ton and commercial material at £8 7s. 6d. Chlorate of soda is on the quiet side, and offers this week are at about 3d. per lb. For caustic soda inquiry is fairly active and values are maintained at from £14 10s. to £16 10s. per ton, according to quality. Nitrite of soda keeps steady and meets with some inquiry at £19 to £19 5s. per ton. A limited demand for hyposulphite of soda has been reported and values are unchanged, with photographic quality quoted at £15 10s. per ton and commercial at £9 10s. Sales of bichromate of soda are of moderate extent, and prices are steady at about 3½d. per lb. Prussiate of soda is also well held at round 4¼d. per lb.

There is not a great deal of business being done in the case of permanganate of potash, but values keep up fairly well, round 6d. per lb. being asked for the B.P. quality and 5⅛d. for the commercial grade. There is a quiet demand for carbonate of potash at firm prices, round £27 per ton now being quoted. Caustic potash is also well maintained at about £30 10s. per ton. Yellow prussiate of potash is being called for in moderate quantities, and quotations for this material are steady and about unchanged on the week at 7¼d. per lb. Bichromate of potash meets with a quiet sale, and about 4¼d. per lb. is still being asked. So far as chlorate of potash is concerned, the demand for this is still on a rather quiet scale, although quotations keep steady at about 3¼d. per lb.

Sulphate of copper remains one of the firmest sections of the market, and values now range from £25 up to £25 10s. per ton, with a steady trade being transacted. In the case of arsenic, however, the poor demand and keen competition are forcing down prices, and white powdered, Cornish makes, can be bought at about £16 per ton at the mines. Acetate of lime is on the quiet side, but prices are about held at £15 10s. per ton for grey material and £9 per ton for brown. Nitrate of lead is fairly steady and in moderate request at £39 per ton. Probably in sympathy with the metal acetate of lead is showing indications of easiness, with white offered at about £43 10s. per ton and brown at £41 15s.

Acids and Tar Products

Current values of tartaric acid are in the neighbourhood of 1s. 2½d. per lb., with a quiet demand reported. Citric acid is firm, although rather quiet at round 1s. 4¾d. per lb. Oxalic acid is exciting little buying interest at the moment, but at about 3d. per lb. there has been little alteration in price levels. Acetic acid keeps steady and meets with a fair amount of inquiry at £67 per ton for glacial and about £37 for 80 per cent. commercial quality.

Among the coal-tar products actual new business in the case of pitch is of limited extent, current quotations being round £3 15s. to £4 per ton. Creosote oil, however, remains steady and in fair inquiry at about 7½d. per gallon. Demand for crystal carbolic is quieter at 9¼d. per lb. Solvent naphtha is quiet and easy at round 1s. 4½d. per gallon.

Annual Meeting of Lever Bros., Ltd.

In the course of his speech at the annual meeting of Lever Bros., Ltd., at Port Sunlight, on Thursday, April 21, the chairman, Mr. F. D'Arcy Cooper, pointed out that with regard to their interests under the headings "West African, Plantations, Oil Milling, and other Raw Material Producing Companies" and "Shares in other Companies and Dividends estimated to be received thereon," in the balance sheet, if they compared the total of £53,085,199 6s. 3d. with last year they would find that there was an increase of £765,000 in these two items. That increase was due mainly to their subscribing in cash for 500,000 shares in the Niger Company for the further development of their interests in the Belgian Congo; to expenditure on their plantations in the Pacific, and to extensions on the soap side of the business, including a new soap factory in course of erection at Buenos Aires. A new factory at Sydney, N.S.W., was also being built by their associated company, J. Kitchen and Sons, Ltd., and another by John Barrington and Sons, Ltd., in Dublin. A recent Government report had referred to the importance of improving the food value of margarine by the inclusion of ingredients rich in vitamins. Unknown to the framers of that report, the very research which they advocated had been going on in Lever Brothers' laboratories for several years past. Indefatigable work had at last been rewarded by the production of a vitamin concentrate which could be readily incorporated in other foodstuffs. The immediate practical result of that discovery had been the placing on the market by their associated company, Planters Foods, Ltd., of a new brand of margarine called "Viking Margarine"—the first of its kind which could claim to have the nutritive value of the best butter, while costing, of course, considerably less.

Voluntary Liquidation of Chemical Manufacturers

The statutory meeting of the creditors of Billowzone, Ltd., chemical manufacturers, of Lamb's Conduit Street, London, W.C.1, was held on Tuesday at the offices of Hyland, Riches and Raw, chartered accountants, 161, Cheapside, E.C. The chair was occupied by Mr. C. W. Raw, the liquidator in the voluntary liquidation of the company, who reported that the liabilities were between £1,100 and £1,150, including directors' fees of about £100. The principal asset was an amount of £1,000 representing uncalled capital, which he thought would be paid. In addition there were book debts of £70, which were estimated to realise £45, and a quantity of stock and certain fixtures and fittings. There was also the goodwill of the business, which might be of considerable value. A number of people were interested in the business, and negotiations were taking place for a sale as a going concern. The company was registered in April, 1925, with a nominal capital of £20,000, and was formed to acquire the goodwill and secret process of "Billowzone." The last accounts prepared covered a period of 15 months, and they disclosed a loss on the trading of something like £4,000. There was every reason to believe that the process would be sold, and that the assets would be more than sufficient to pay the whole of the liabilities in full. A resolution was passed confirming the voluntary liquidation of the company with Mr. Raw as liquidator.

A Product for the Textile Trade

Urtenol, a product for use in the textile trade, has been put on the market by Fletcher, Miller, Ltd., of Alma Mills, Dukinfield, near Manchester. It is said to possess the property of absorbing large quantities of lime or magnesia salts without forming a precipitate in the fibre; to be able to reduce the quantity of caustic soda and soda ash in bleaching, saving time and labour costs; and to wet-out goods quickly, thus giving more even and better results. A booklet on the subject has been issued by the agents for the north, Millwards Merchandise, Ltd., of 14a, Blackfriars Street, Manchester, in which its properties and uses are described at length. It is a combination of oils, which is claimed to possess great penetrative and detergent properties, to be soluble in water, and to form a stable emulsion in the acid bath. It has no action on metals. It quickly dissolves cotton, linen, and paraffin waxes, mineral oils, pectic and fatty bodies, colouring matter, etc., contained in cotton and other vegetable fibre. Urtenol is described as being a real assistance in the bleaching, dyeing, and mercerising of cotton.

Company News

VENO DRUG CO.—A dividend of 25 per cent. for the year ended January 31 is announced.

EASTMAN KODAK CO.—The report for the year shows a net profit of $19,860,634 as against $18,467,113 for the year 1925.

TARMAC, LTD.—The directors have authorised the payment, on May 2, of a dividend on the 5½ per cent., free of income tax, cumulative preference shares in respect of the half-year ended December 31 last.

PARKES, CHEMISTS.—The accounts for the past year show a divisible balance of £9,321. A final dividend of 5 per cent. is proposed on the ordinary shares, making 7½ per cent. for the twelve months, and carrying forward £2,440.

ANTON JURGENS' VEREENIGDE FABRIEKEN (ANTON JURGENS UNITED MARGARINE WORKS).—A dividend of 10 per cent. is proposed after allocating 1,000,000 guilders to the sinking fund and about 1,800,000 guilders to the reserve; 8,790,000 guilders are carried over, as against 8,730,000 guilders last year.

BRITISH DRUG HOUSES, LTD.—The report of the British Drug Houses shows the effect of the coal strike. An encouraging point, however, is the increased turnover in the first quarter of the current year. No dividend is declared, as out of the gross profit of £16,864, £11,092 is required for amortisation and depreciation, leaving a net profit of £5,772. Out of the available balance of £12,491, the preference dividend absorbs £9,680, and there is £2,811 to carry forward.

BRITISH BEET GROWERS, LTD.—A loss of £2,645 was reported at the first annual meeting held in London on Friday, April 22. Mr. T. H. Evans, explaining the causes of the loss said that the total tonnage of beet washed last year was disappointing. They had hoped to get eight tons per acre, but only got 4·4 per acre. He also explained that in the balance sheet they had allowed nothing for the value of the tops of the beet which were worth from £2 to £3 per acre. That would have made £1,000 in their favour, and he anticipated getting this in the coming year, and not only wiping out the debit balance, but making a substantial profit.

ROPP TIN CO.—The profit and loss account for the year ended December 31, 1926, shows a balance of profit of £94,234. This, added to £54,591 brought forward, makes a total of £148,825. Interim (20 per cent.) and final (5 per cent.) dividends for 1925, paid in February and July, 1926, and two interim dividends (20 per cent. each) paid in July and November, 1926, absorbed £109,200. The directors recommend a final dividend on account of 1926 of 15 per cent., less income-tax (making 55 per cent. for the year), which will account for a further £25,200, leaving, subject to directors' additional remuneration, £14,425. The directors have declared an interim dividend on account of 1927 of 10 per cent., less income tax, payable on May 11, 1927, to shareholders registered on April 20, 1927.

AMALGAMATED ZINC (DE BAVAY'S).—The directors' report states that the balance at credit of appropriation account at June 30 last was £51,787, from which the thirty-ninth dividend was paid, leaving a balance of £26,787. The profit for the half-year ended December 31, 1926, amounted to £10,746, derived from dividends received on shares in other companies, £6,987, interest earned, etc., £7,000, less usual profit and loss debits. This profit added to £26,787 previously referred to make available £37,534, which is carried forward in appropriation account. Since the close of the last half-yearly period £7,580 has been received in dividends from Minerals Separation and De Bavay's Processes Australia Proprietary, Ltd. Liquid assets show a surplus over liabilities of £250,792, not including amount paid on shares in other companies, vide last balance-sheet, except 300,000 ordinary shares of Electrolytic Zinc Co. of Australasia, Ltd., which have been distributed.

BRITISH CYANIDES CO., LTD.—The High Court of Justice having confirmed the special resolution reducing the capital of the company from £450,000 to £118,725 8s., the further resolution increasing the capital of the company to £450,000, divided into 284,975 preference shares of 2s. each and 4,215,025 ordinary shares of 2s. each, has come into operation; 672,838 ordinary shares of 2s. each are now being offered to existing shareholders in the proportion of two new ordinary shares for each ordinary share held by them on April 25. The shares, when fully paid, will rank for dividend and otherwise pari passu with the existing ordinary shares of the company. In the course of a circular to the shareholders it is stated that there has been a marked improvement in the position of the company since Christmas, illustrated by the following figures: Average monthly loss for last financial year, £972 10s.; loss for month of January, 1927, £845 9s. 9d.; for February, £418 3s. 7d.; profit for March £92 1s. 2d. These figures are arrived at after deducting all expenses except interest on bank loans, which will be repaid out of the proceeds of this issue, and depreciation on plant written down under the reduction of capital. The improvement in the price of prussiate of soda has been maintained, and new markets are being found for thiocarbamide and other chemicals, the sale of which leaves a satisfactory margin of profit. The business in which the company is interested on its own account has therefore shown a marked revival since Christmas which should not only be maintained but expanded. It is, however, to provide funds for the new business, after repaying bank loans, that the issue of shares is being made, and in this connection it is important to bear in mind that all profits derived from the new synthetic resin, or any products made therefrom, are shared equally by the company with the Beetle Products Co., and, in addition, that this company holds more than two-fifths of the issued ordinary share capital of the Beetle Products Co., Ltd., whose sales of powder during the month of March were more than double those for any previous year.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Gee & Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to May 20, 1927.

"APEX."

477,769. Cellulose acetate in granular form. Class 1. Apex (British) Artificial Silk, Ltd., 100, Carpenter's Road, Stratford, London. E.15; manufacturers. February 14, 1927. (To be associated. Section 24.)

"EUREKA."

478,444. Carbon gas black, being a pigment. Class 1. Imperial Oil and Gas Products Co. (a company incorporated under the laws of State of West Virginia, U.S.A.), Union Bank Building, Corner of Fourth Avenue and Wood Street, Pittsburgh, Pennsylvania, U.S.A.; manufacturers March 3, 1927.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

MOISTURE TESTING THERMOMETERS.—The Department of Overseas Trade has received an inquiry from Winnipeg for moisture testing thermometers. (Reference B.X. 3450.)

DRUGS, CHEMICALS AND PHARMACEUTICAL PREPARATIONS.—The representative of a Sydney firm of importers and manufacturers is at present in London and is anxious to get into touch with British manufacturers of such preparations with a view to representing them. Replies should be addressed in the first instance to the Official Secretary, Commercial Bureau, Australia House, Strand, London, W.C.2, quoting Reference No. 437.

SHELLAC.—An agent established at Brussels is desirous of obtaining the representation of British dealers on a commission basis. (Reference No. 412.)

Tariff Changes

DOMINICA.—Item 9 of the Export Schedule of duties relating to essential oils has been amended by substituting the words "local value" for the words "price in the local market" in that item.

SALVADOR.—A recent Decree in San Salvador provides that a duty of 2 cents (gold) per kg. is to be levied on impur sulphite of sodium (raw materials for tanneries) on importation into Salvador.

Bede Metal and Chemical Co.: Annual Meeting

MR. J. EMERY TULLY (vice-chairman), presiding at the annual meeting of the Bede Metal and Chemical Co., Ltd., held at Newcastle on Thursday, April 21, expressed a more hopeful feeling for this year.

Last year the coal stoppage greatly retarded the activities of the company, he said. But for the miners' dispute there might have been a credit instead of a debit balance at the end of the year. Rates were an enormous burden to the undertaking, he pointed out, last year the sum paid being over £3,000, which was equal to 1s. 6d. per ton on the ore treated. In these circumstances it was almost impossible to compete with continental works.

This year they commenced fairly well, having treated about 4,000 tons of ore in January, 3,670 tons in February, and 4,200 tons in March. The latter figure was a record for the works. Taking things all round they were working at a small profit. He thought they might reasonably look forward to an improved balance-sheet next year. He formally moved the report. Mr. Wilfred Hall seconded, and mentioned that costs at the works had been brought down considerably. The report was adopted.

Canadian Manufacture of Titanium White

CANADIAN ilmenite ores will soon be used in the manufacture of "Titanium White," according to Mr. R. H. Monk, of McArthur, Irwin, Ltd., Montreal, who told the Toronto Club of Paint and Varnish Manufacturers that plans are nearing completion for the erection of a plant in Montreal. If everything developed as expected, erection of the plant would be made during the autumn of this year, Mr. Monk said. Ilmenite, of which there are large deposits in the province of Quebec, notably at Ivry and St. Urbain, contains iron and titanium oxide, and the first part of the process of manufacture is to separate these constituents. The iron is recovered as a by-product in the form of electrolytic iron, and the titanium oxide is then combined with barium carbonate, made from Canadian barytes, to produce the white pigment, which is chemically barium titanate. This will represent a new and important use of Canadian mineral deposits.

Fire at Western Viscose Silk Mills

FLAMES were seen for miles around when fire broke out at the works of the Western Viscose Silk Mills, Bristol, early on the morning of Thursday, April 21. At about 2 o'clock the night shift was alarmed by an explosion, caused by the bursting of a carbon bisulphate cock in the churn room. A blue flame shot up and a tank of carbon bisulphide caught fire. They tried hard to overcome the outbreak, but so rapidly did it spread that brigades had to be called out. The inhabitants of houses which enclose the factory on all sides rushed from their homes in alarm, but fortunately the fire took an upward course, and the damage was confined to the one department and the roof. One man was gassed by fumes and others injured, but no one seriously. The full extent of the damage is not yet known, but it is feared that the works may have to be closed for a time.

Explosion at Scottish Dyes

THE greater part of a roof was lifted off a building when an explosion occurred at the works of Scottish Dyes, Ltd., Grangemouth, on Friday, April 22. A process under pressure was going forward in an iron pan in the building when for reasons unknown an explosion took place inside the pan, and the lid, measuring about three feet across, burst its bolts and was hurled through the roof. Three men were rather seriously hurt by the explosion.

Agent for Australia

MR. H. N. COX, importer and manufacturer of drugs and chemicals, pharmaceutical preparations, etc., is now in London, and wishes to hear from British firms interested in the appointment of an Australian agent. Letters should be addressed care of Australia House, Strand, London, W.C.2.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

ALCHEMISE, LTD., Bristol, paint manufacturers. (M., 30/4/27.) Registered April 7, £600 mortgage to District Investment Fund of the A.O.F. Bristol United District; charged on The Chestnuts, Bath Street, Staple Hill, Mangotsfield.

BATHITE, LTD., Bath, chemical manufacturers. (M., 30/4/27.) Registered April 9 (by order on terms), £750 mortgage and £250 2nd mortgage, to A. Mortimer, Garland Farm, Holt (Wilts), farmer, and Mrs. E. Ahlert, 24, Dunster Gardens, Brondesbury; charged on land at Monkton Combe.

Receivership

RAIMES AND CO., LTD. (R., 30/4/27.) W. Harland, C.A., of 41, High Street, Stockton-on-Tees, was appointed receiver and manager on April 6, 1927, under powers contained in second debenture dated March 31, 1925.

London Gazette, &c.

Companies Winding Up Voluntarily

ABBEYGATE CHEMICAL CO., LTD. (C.W.U.V., 30/4/27.) By special resolution, March 30, confirmed April 14. W. G. Hayward, 41, Hamilton Road, Southville, Bristol, a director of the company, appointed liquidator. Meeting of creditors at 40, Corn Street, Bristol, Saturday, April 30, at 10 a.m.

FATOX, LTD. (C.W.U.V., 30/4/27.) By special resolution March 31, confirmed April 20. R. Bentley, chartered accountant, Barclays Bank Chambers, Market Place, Dewsbury, appointed liquidator. Meeting of creditors at the offices of H. Appleyard and Co., chartered accountants, Barclays Bank Chambers, Market Place, Dewsbury, on Tuesday, May 10, at 11 a.m. Creditors claims by June 21. All creditors have been, or will be, paid in full.